MOTOMAN NX100
USER'S MANUAL
Ladder Editor 32NX

Upon receipt of the product and prior to initial operation, read these instructions thoroughly, and retain for future reference.

MOTOMAN ROBOTICS EUROPE
A subsidiary of YASKAWA Electric Corporation

MANUAL NO. MRS55130

Reference list

Basic Operator's Manual
Windows User's Manual

Revision

First issue of this manual.

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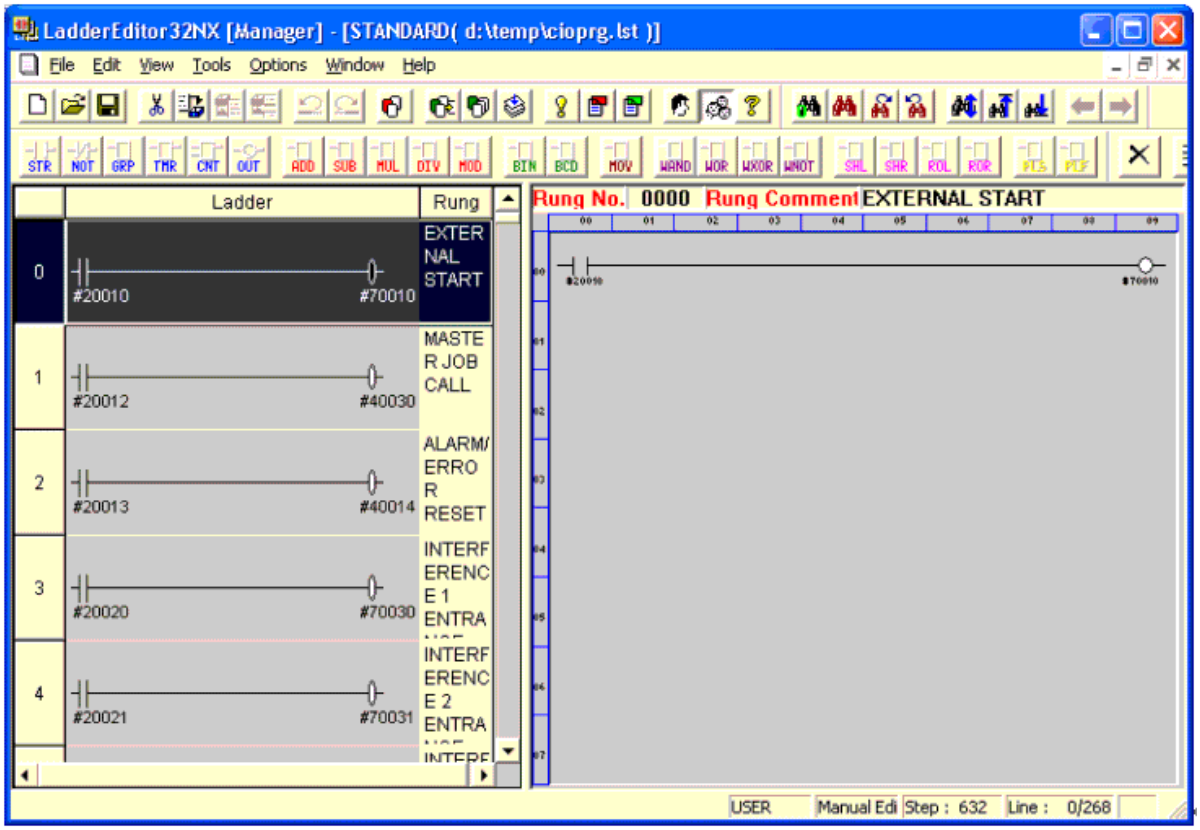
Ladder Editor 32NX (32-bit)

Manual valid for Ladder Editor 32NX.



1. General

Ladder Editor 32NX is a 32-bit PC-software, for MS Windows 2000 / XP environment.

The robot controller (YASNAC NX100) has a concurrent I/O function that processes I/O related control independently from the manipulator, and in parallel with the manipulator operation. Ladder Editor 32NX software is used to graphically display ladder programs with the above function as a signal connection diagram, or to edit commands by drag and drop operation using the mouse.

For more basic information about installation and handling of the software, icons, menu bars, etc. refer to the operator's manual for Windows 2000 / XP.

✔ This manual shall always be available to operator.

✔ This User's Manual comprises information about

✔ Installation / Setup / Handling / operation for NX100 robot controller

✔ Text written in **BOLD** letters means command, icon or button.

✔ Text written in *ITALIC* means text shown on display.

1.1 Copyright

The disks for Ladder Editor 32NX-program may not be copied or imparted to a third party nor be used for an unauthorized purpose. Copies may be done only for own backup.

This manual may not be copied or imparted to a third party nor be used for an unauthorized purpose.

1.2 Ladder Editor 32NX-kit

■ *Ladder Editor 32NX-kit comprises*

✔ Diskettes (for Ladder Editor 32NX and drivers) or CD-ROM

✔ Hardware key

✔ One manual

✔ One registration card

■ *Ladder Editor 32NX-kit does not comprise*

✔ Cables or adapters, etc.

■ *Further you may have need for*

✔ Programming manual for your robot controller.

✔ Operator's manual for MS Windows 2000 / XP.

1.3 General Precautions

Diagrams and photos in this manual are used as examples only and may differ from the actual delivered product.

This manual may be modified when necessary because of improvement of the product, modification, or changes in specifications.

Such modification is made as a revision by renewing the manual No.

To order a copy of this manual, if your copy has been damaged or lost, contact your YASKAWA representative listed on the last page stating the manual No. on the front page.

YASKAWA is not responsible for any modification of the product made by the user since that will void our guarantee.

Software supplied with this manuals intended for use by licensed operators only and may only be used or copied according to the provisions of the license.

Reproduction of any part of this manual without the consent of YASKAWA is forbidden.

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Trademark: MS Windows 2000 / XP are registered trademarks of Microsoft Corporation, U.S.A.

Ladder Editor 32NX is a trademark of YASKAWA.

2. Software Installation

2.1 Installation

There are three ways to start installation of this software, all will give the same result. The most common way is described below.

a) Login in administrator mode in order to add files to system folder and input information in registry.

b) Keep in mind that in case of using usb hardware lock key, the key must not be attached during the installation.

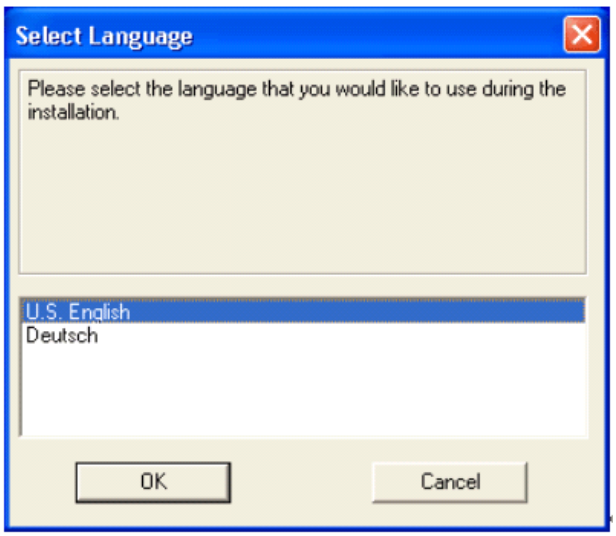
c) Insert cd in your CD-ROM drive.

d) If the application will not start automatically, open windows explorer, select the letter of your cdrom drive, run executable**.**

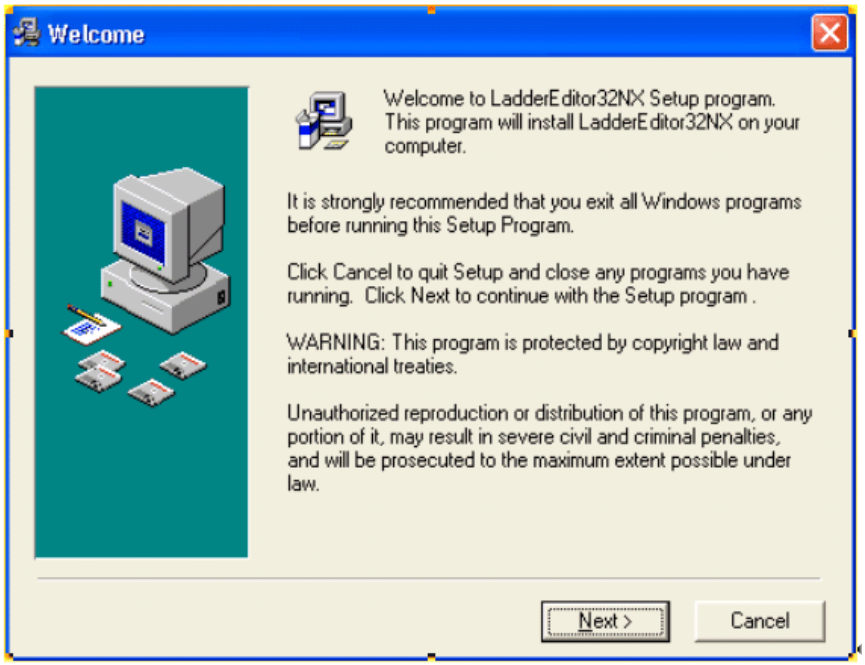
e) Start menu appears.

f) Install LadderEditor by selecting the appropriate menu item.

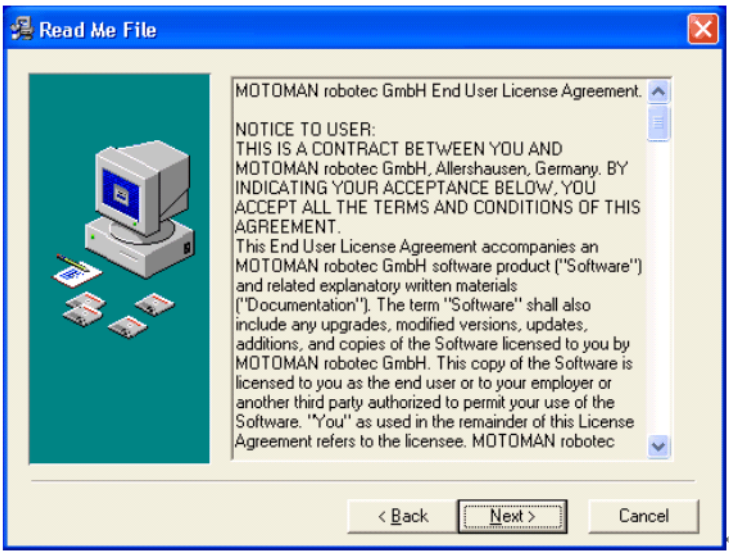
g) Select installation language.



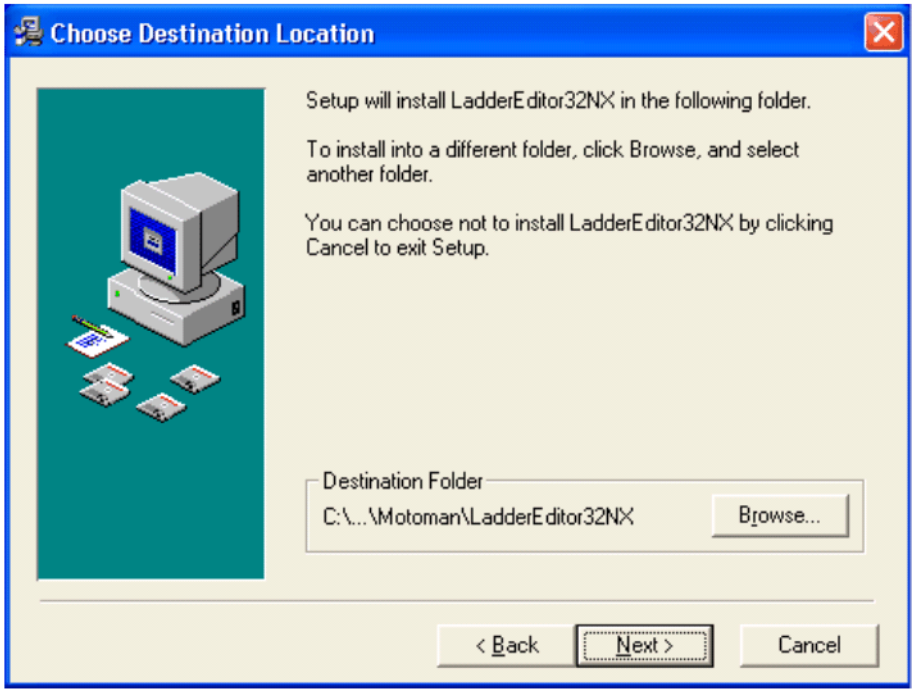
h) Pass this information screen.


Welcome
Welcome to LadderEditor32NX Setup program. This program will install LadderEditor32NX on your computer.
It is strongly recommended that you exit all Windows programs before running this Setup Program.
Click Cancel to quit Setup and close any programs you have running. Click Next to continue with the Setup program .
WARNING: This program is protected by copyright law and international treaties.
Unauthorized reproduction or distribution of this program, or any portion of it, may result in severe civil and criminal penalties, and will be prosecuted to the maximum extent possible under law.
Next >
Cancel

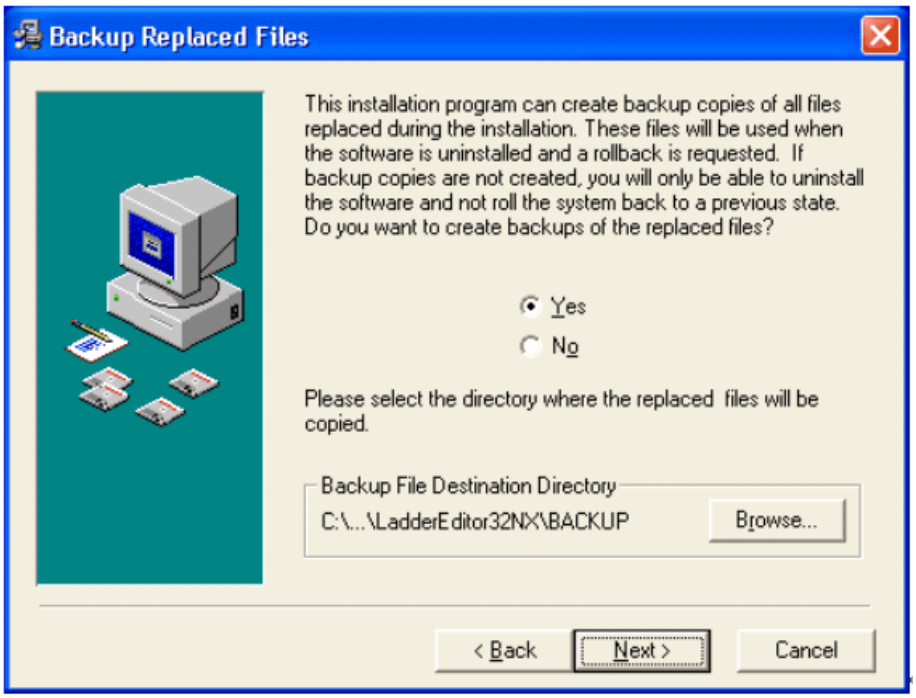
i) Read through the license agreement and accept by clicking on the Next button.


Read Me File
MOTOMAN robotec GmbH End User License Agreement.
NOTICE TO USER:
THIS IS A CONTRACT BETWEEN YOU AND MOTOMAN robotec GmbH, Allershausen, Germany. BY INDICATING YOUR ACCEPTANCE BELOW, YOU ACCEPT ALL THE TERMS AND CONDITIONS OF THIS AGREEMENT.
This End User License Agreement accompanies an MOTOMAN robotec GmbH software product ("Software") and related explanatory written materials ("Documentation"). The term "Software" shall also include any upgrades, modified versions, updates, additions, and copies of the Software licensed to you by MOTOMAN robotec GmbH. This copy of the Software is licensed to you as the end user or to your employer or another third party authorized to permit your use of the Software. "You" as used in the remainder of this License Agreement refers to the licensee. MOTOMAN robotec
< Back
Next >
Cancel

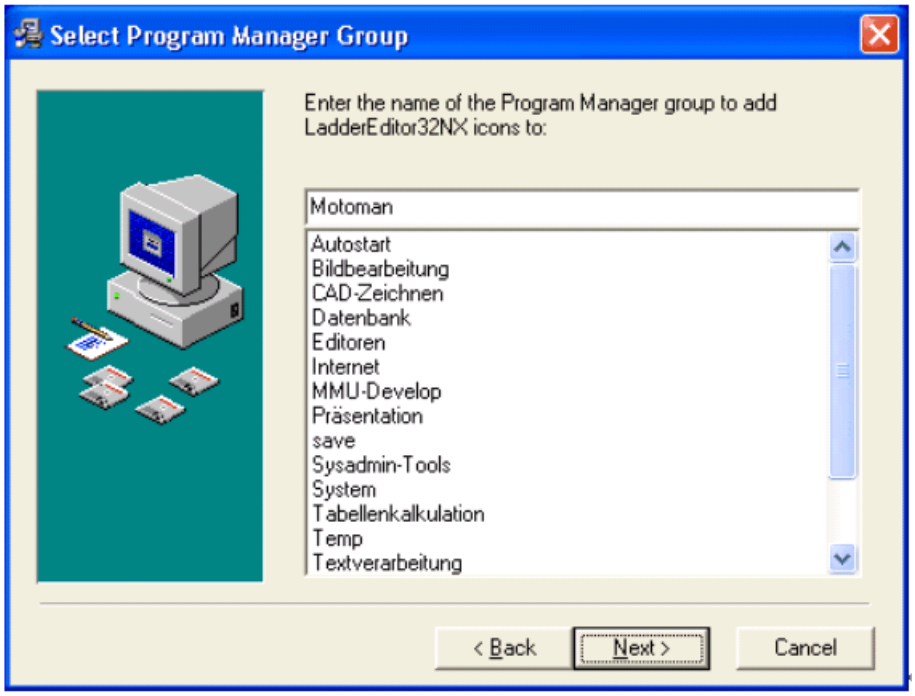
j) Choose destination folder, where application files should be installed.


Choose Destination Location
Setup will install LadderEditor32NX in the following folder.
To install into a different folder, click Browse, and select another folder.
You can choose not to install LadderEditor32NX by clicking Cancel to exit Setup.
Destination Folder
C:\...\Motoman\LadderEditor32NX
Browse...
< Back
Next >
Cancel

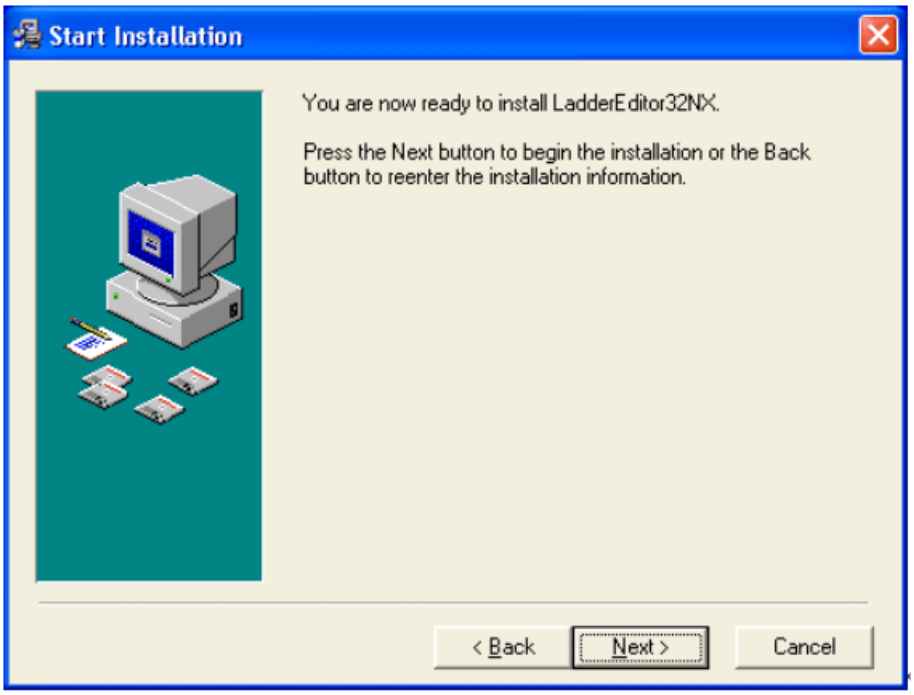
k) Choose whether to create backup files or not.


Backup Replaced Files
This installation program can create backup copies of all files replaced during the installation. These files will be used when the software is uninstalled and a rollback is requested. If backup copies are not created, you will only be able to uninstall the software and not roll the system back to a previous state. Do you want to create backups of the replaced files?
Yes
No
Please select the directory where the replaced files will be copied.
Backup File Destination Directory
C:\...\LadderEditor32NX\BACKUP
Browse...
< Back
Next >
Cancel

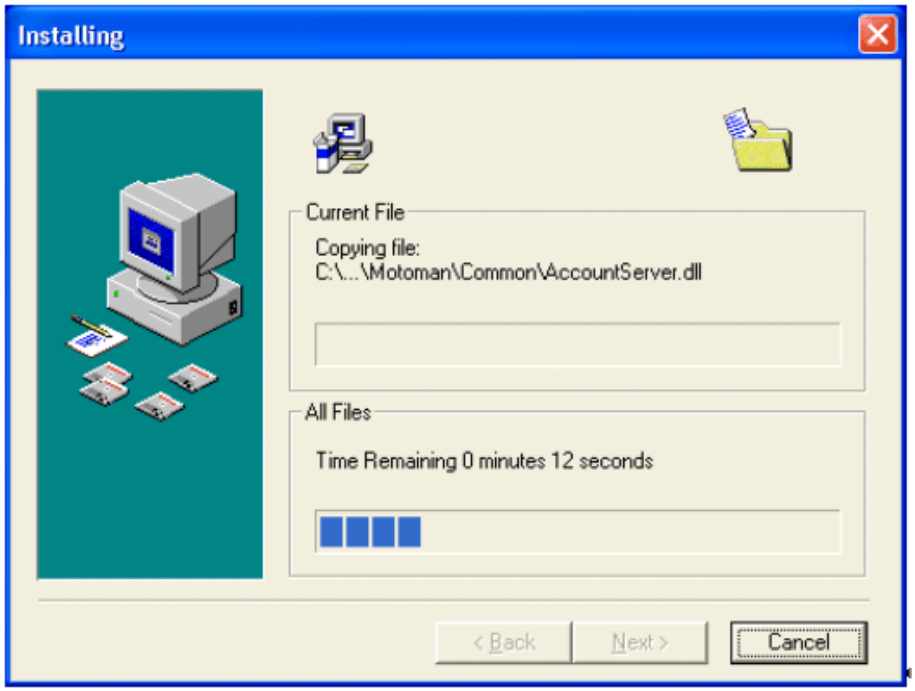
l) Select Program Manager group.



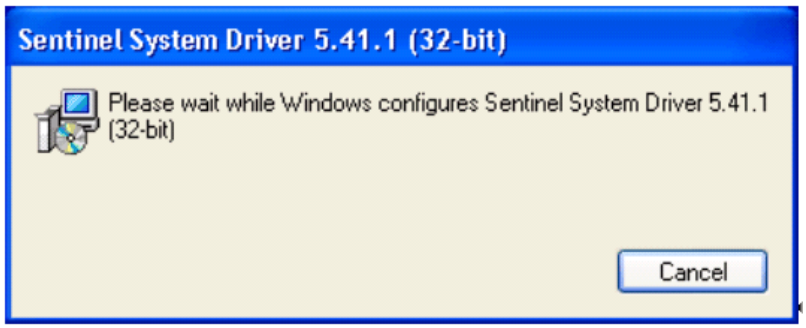
m) Start Installation.


Start Installation
You are now ready to install LadderEditor32NX.
Press the Next button to begin the installation or the Back button to reenter the installation information.
< Back
Next >
Cancel

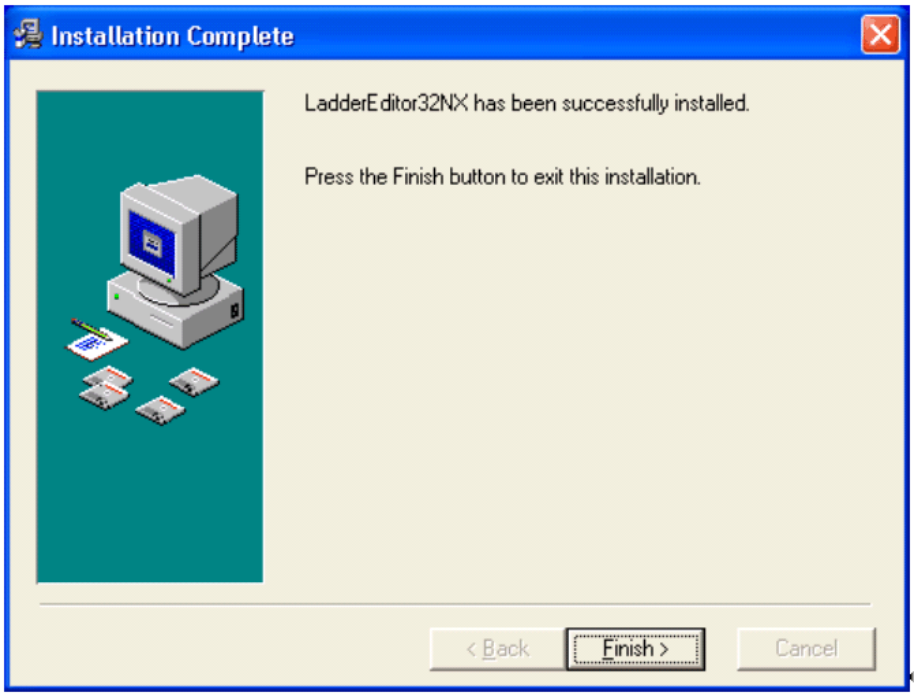
n) Installation starts.



o) After the application files are installed the hardware lock key driver will be installed



p) Click Finish-button to finish installation.


Installation Complete
LadderEditor32NX has been successfully installed.
Press the Finish button to exit this installation.
< Back
Finish >
Cancel

q) When setup has finished a reboot may be necessary.

2.2 After installation

After installation, fill in and return the registration card to Motoman.

During installation the main directory is automatically created and all necessary files are installed in the specified drive.

In the end of the setup a program group (MOTOMAN) and a icon is created. To start Ladder Editor 32NX just double-click on the **Start Menu**.

2.3 Uninstall

As in all MS Windows 2000/XP softwares there are an uninstall facility if you want to remove the software from the hard disk.

a) Start the **Control panel** from the start menu. Select **Add/Remove** button from the menu.

b) Mark the line **Ladder Editor 32NX** from the menu.

c) Click **Add/Remove** button.

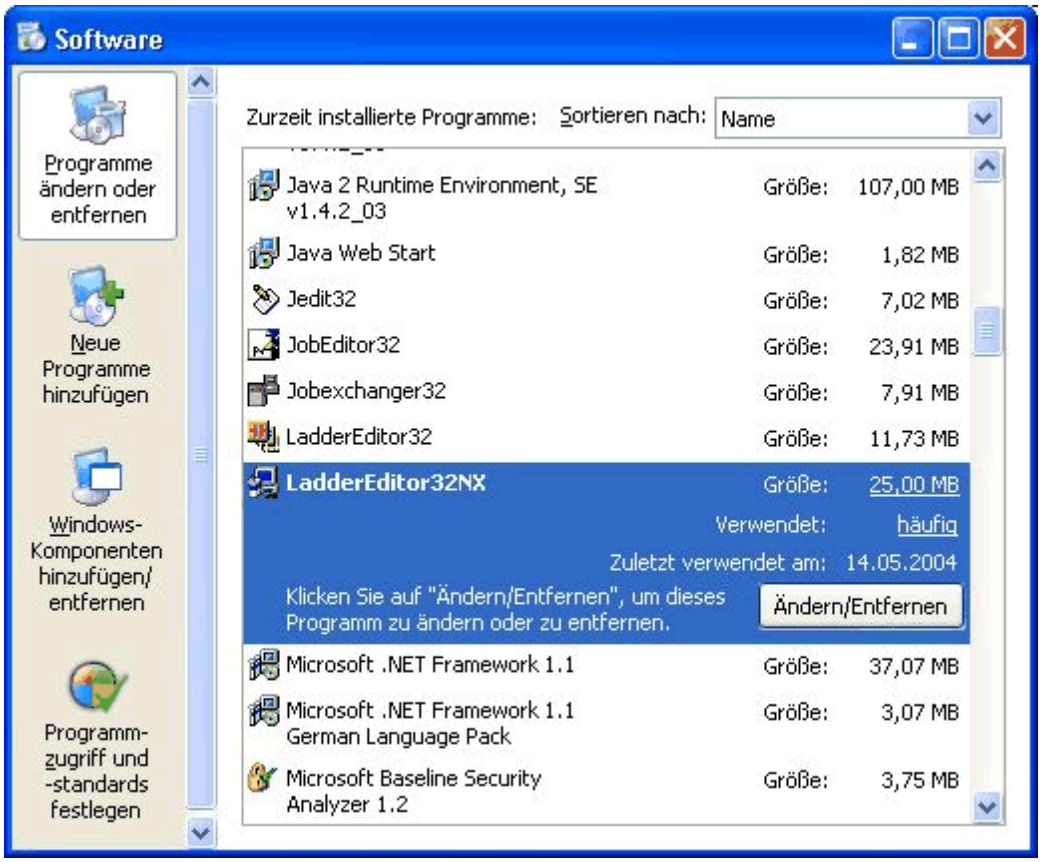


Fig.1 Ladder Editor 32NX

d) Activate uninstall guide by **Next**-button.

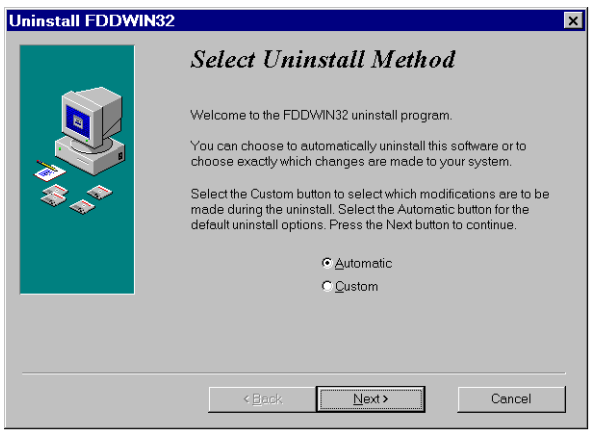

Uninstall FDDWIN32
Select Uninstall Method
Welcome to the FDDWIN32 uninstall program.
You can choose to automatically uninstall this software or to choose exactly which changes are made to your system.
Select the Custom button to select which modifications are to be made during the uninstall. Select the Automatic button for the default uninstall options. Press the Next button to continue.
Automatic
Custom
< Back
Next >
Cancel

Fig.2 Automatic uninstall

e) End the operation by clicking the **Finish**-button.

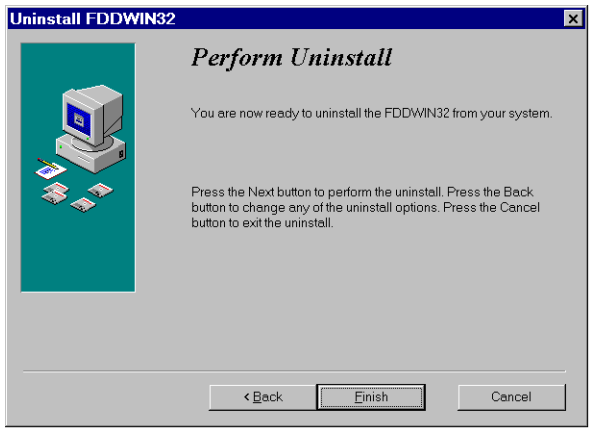

Uninstall FDDWIN32
Perform Uninstall
You are now ready to uninstall the FDDWIN32 from your system.
Press the Next button to perform the uninstall. Press the Back button to change any of the uninstall options. Press the Cancel button to exit the uninstall.
< Back
Finish
Cancel

Fig.3 Uninstall

3. Ladder Editor 32NX basic display

The following shows the "basic" display of Ladder Editor 32NX. The "basic" display is divided into two displays: "ladder preview" display and "ladder editing" display. Editing is available as referring to the ladder image before and after the ladder diagram in the editing line.

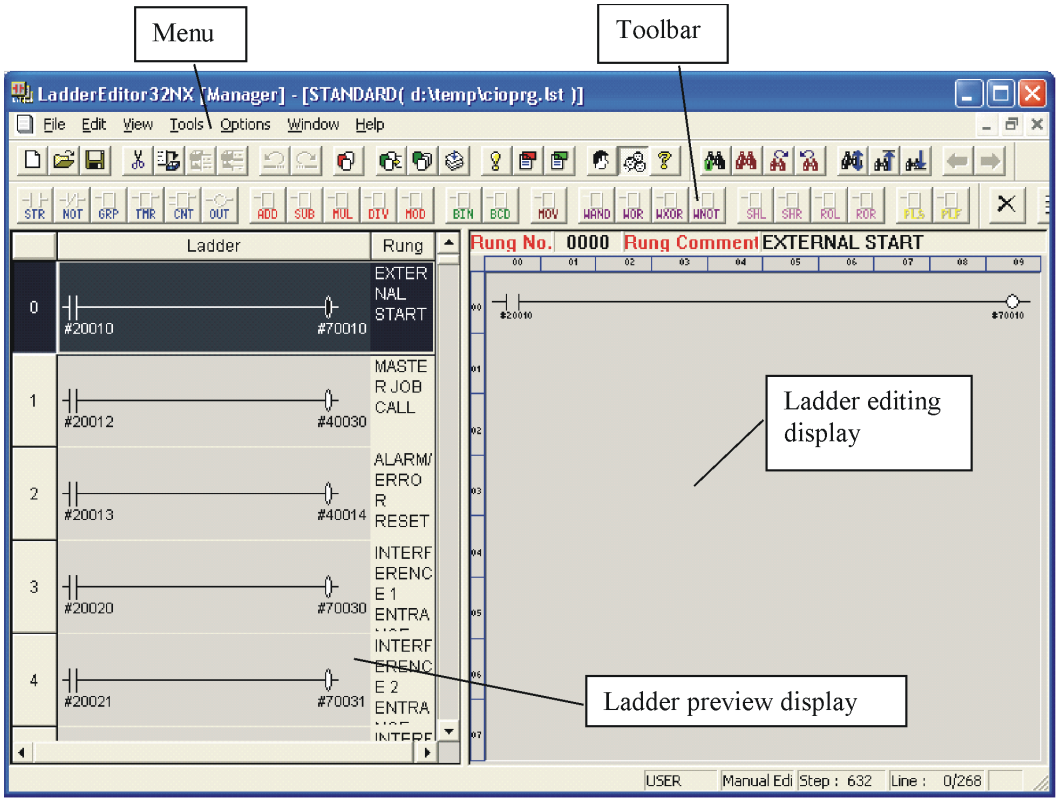


Fig.4 „Basic" Display

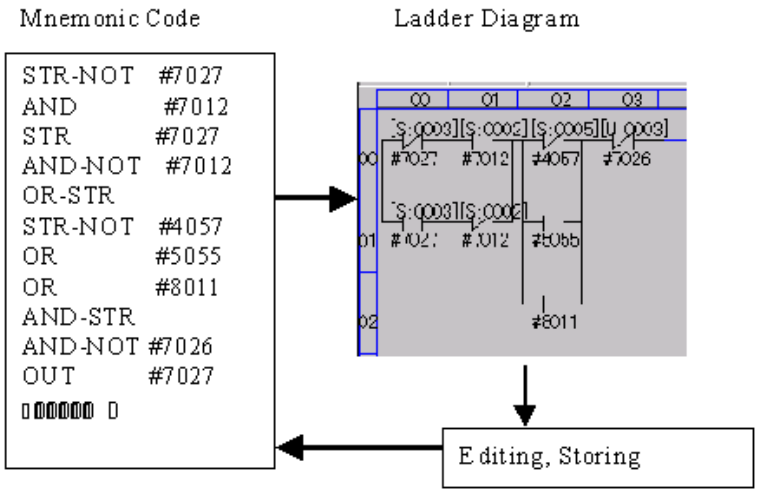
4. Specifications

4.1 Function

The robot controller (YASNAC NX100) has a concurrent I/O function that processes I/O related control independently from the manipulator, and in parallel with the manipulator operation. Ladder Editor 32NX software is used to graphically display ladder programs with the above function as a signal connection diagram, or to edit commands by drag and drop operation using the mouse.

■ *Features of Ladder Editor 32NX*

✔ Ladder mnemonic code can be edited with an image of a ladder diagram.



✔ With the "ladder preview" display, the entire line of the ladder program can be easily previewed.

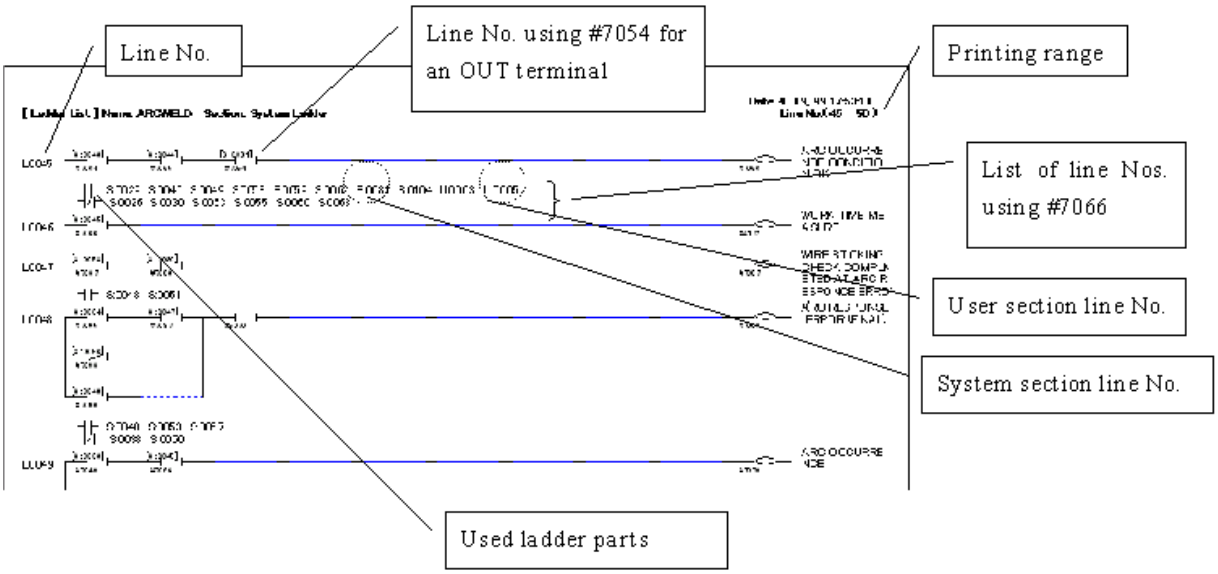
✔ Simple drag and drop operation can edit connections between ladder parts.

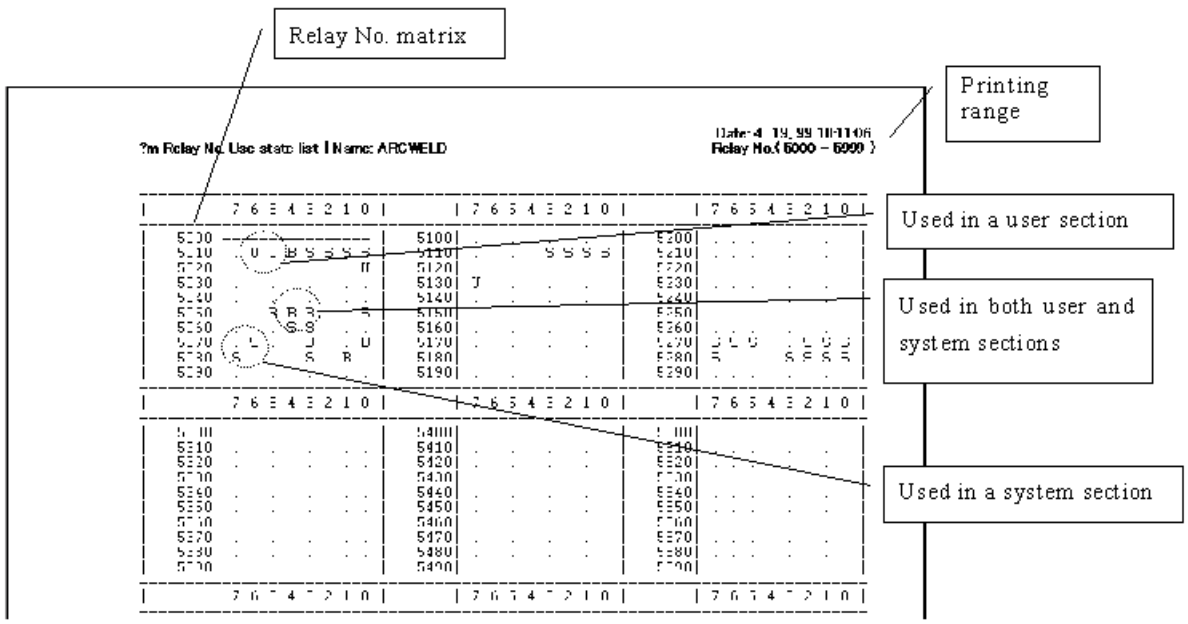
✔ The cross reference function is enriched. Information such as relay No. use state or the place where an arbitrary relay No. is used can be referenced easily.

✔ A history jump function is available. This function records the history of jumping to other lines, and easily returns to the previous line before jumping.

✔ A password function is available. Since ladder editing affects the system, this system has a user management option. The software can be set up to require a correct password to start up the software.

✔ The printing function is enriched. The cross referenced information and the ladder diagram can be printed. This function is useful when storing the ladder diagram as an output document.


Line No.
Line No. using #7054 for an OUT terminal
Printing range
List of line Nos. using #7066
User section line No.
System section line No.
Used ladder parts



4.2 Hardware configurations and software type

■ Hardware requirements

Ladder Editor 32NX operates with the configurations shown below.

OS	MS Windows XP / 2000
Required Memory	32 Mbytes or more
CPU	Pentium or Pentium compatible processor
Hardware Disk Capacity for Installation	30 Mbytes or more
Disk Drive	Hard disk drive and CD-ROM drive
Display	Supported by MS-Windows
Mouse	Supported by MS-Windows
Robot Controller	NX100
Hardware Lock Key	Used under single user registration. If a conversion adapter is required, refer to "Hardware Lock Key" for details.

Note!
This software is ladder editing software, not a ladder simulator.

The following devices or software are required when sending data between the NX100 and the personal computer.

✔ The floppy disk drive exclusively used for the NX100, "YASNAC FC2"

✔ The personal computer communications software, "FDDWIN32"

✔ The data transmission function between the personal computer communications software "MOTOCOM32" and the NX100.

4.3 Hardware Lock Key installation

For proper operation, connect provided hardware lock key to personal computer before using this software.

Two types of hardware lock keys are available;

- USB type
- D-sub type

Followings are the connecting methods of each key type.

Connecting of D-sub type key

<Installation of driver>

The driver is installed during installation of the application. So there is no need to start additional driver setup software. To check for proper driver installation after application setup, change to system control Add/Remove software section. Search the list of installed software for an entry named "Sentinel System Driver 5.41.1 (32-bit)".

Note:

1. When installing the application under WindowsXP/2000 environment, be sure to login in administrator mode in order to add files to system folder and input information in registry.

Attach the key to the printer port(parallel port) of your pc.

Connecting of USB type key

Check and execute the following items before connecting the key to USB port.

<Check the computing environment>

Multi-connection of USB type key is not available for one USB port because of hardware structure. Therefore, only one key should be connected to one USB port. When multi-connecting USB keys installing multiple offline software into one personal computer, use the personal computer which is provided same numbers of USB ports as the number of software to be installed.

<Installation of driver>

The driver is installed during installation of the application. So there is no need to start additional driver setup software. To check for proper driver installation after application setup, change to system control Add/Remove software section. Search the list of installed software for an entry named "Sentinel System Driver 5.41.1 (32-bit)".

Note:

1. When installing the application under WindowsXP/2000 environment, be sure to login in administrator mode in order to add files to system folder and input information in registry.
2. If a key is connected to personal computer before installing the driver, Windows wizard ([Add New Hardware] Wizard) starts up. In this case, push [cancel], and detach the key from personal computer and then install the application.

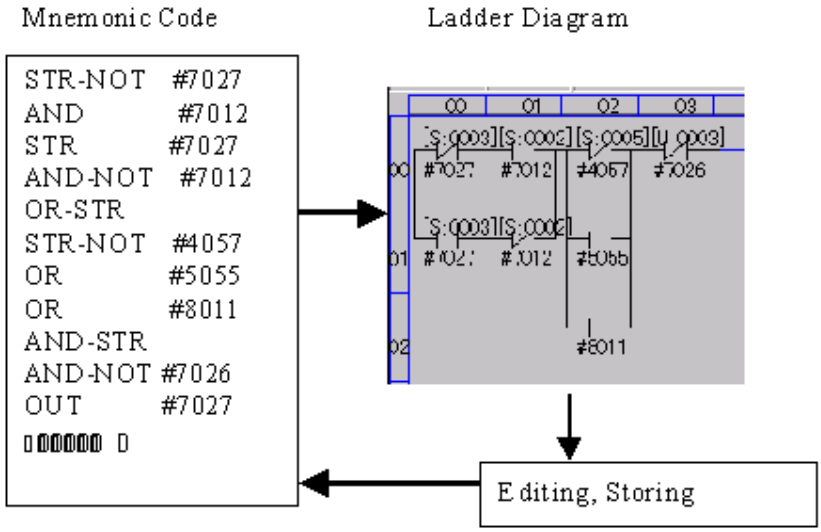
Attach the key to the USB port of your PC.

4.4 What is Ladder Editor 32NX?

The robot controller (YASNAC NX100) has a concurrent I/O function that processes I/O related control independently from the manipulator, and in parallel with the manipulator operation. Ladder Editor 32NX software is used to graphically display ladder programs with the above function as a signal connection diagram, or to edit commands by drag and drop operation using the mouse.

■ *Features of Ladder Editor 32NX*

✔ Ladder mnemonic code can be edited with an image of a ladder diagram.

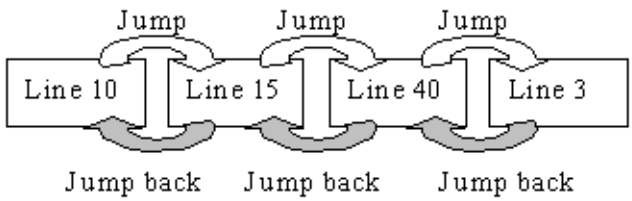


✔ With the "ladder preview" display, the entire line of the ladder program can be easily previewed.

✔ Simple drag and drop operation can edit connections between ladder parts.

✔ Cross reference function is enriched. Information such as relay No. use state or the place where an arbitrary relay No. is used can be referenced easily.

✔ History jump function is available. This function records the history of jumping to other lines, and easily returns to the previous line before jumping.



✔ Printing function is enriched. Cross reference information can also be printed, as well as ladder diagrams. This function is very useful when a created ladder is stored as reference material.

■ *Terms*

The following terms are frequently used in this manual.

Terms	Description

Ladder editor	Object of matrix composing a ladderprogram such as STR, TMR or GRP.
Set value	Value set to ladderparts such as relay numbers, register numbers or constants.
Line	One line indicates one section divided with OUT codes in a ladder memnemonic. Normally, there is one OUT part per line (excluding when GRP parts are used).

5. Default user name and password

■ *Default informations (for manager store)*

The following table shows the default user names (user IDs) and passwords at log-ON that Ladder Editor 32NX provides. "Managers" must store this information confidentially so that it will never be known to "Operators" or "Backup Operators".

Level Name	User Name	PassWord
Manager	Admin	00000000
Operator	User	0
Backup Operator	backup	None

6. Flowchart of basic editing

The following shows the basic flowchart of ladder editing.

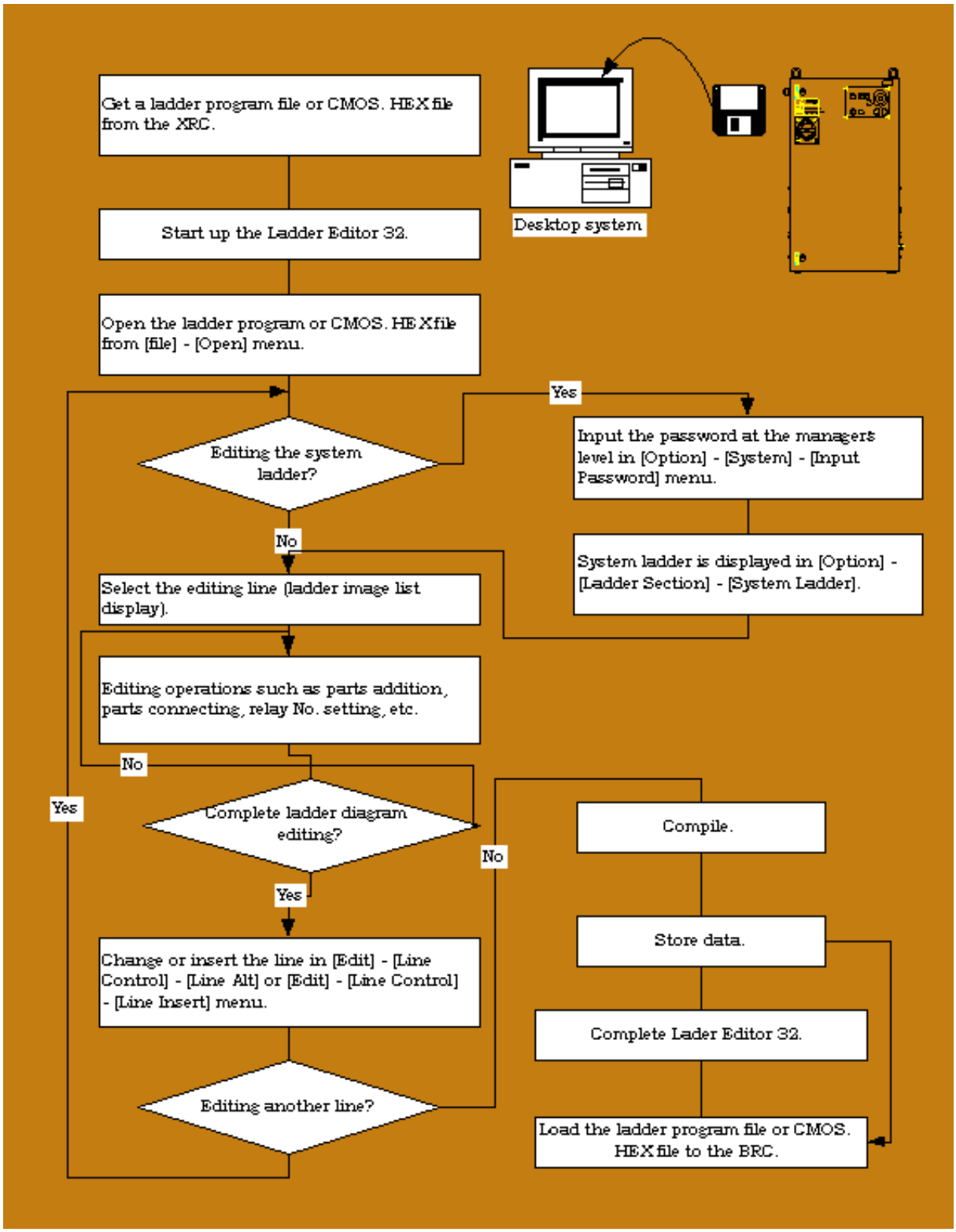

Get a ladder program file or CMOS. HEX file from the XRC.
Start up the Ladder Editor 32.
Open the ladder program or CMOS. HEX file from [file] - [Open] menu.
Editing the system ladder?
Yes
Input the password at the managers level in [Option] - [System] - [Input Password] menu.
System ladder is displayed in [Option] - [Ladder Section] - [System Ladder].
No
Select the editing line (ladder image list display).
Editing operations such as parts addition, parts connecting, relay No. setting, etc.
No
Yes
Complete ladder diagram editing?
No
Yes
Change or insert the line in [Edit] - [Line Control] - [Line Alt] or [Edit] - [Line Control] - [Line Insert] menu.
Editing another line?
Compile.
Store data.
Complete Lader Editor 32.
Load the ladder program file or CMOS. HEX file to the BRC.
Desktop system

Fig.5 Ladder Editing Operation Flow

7. Starting and ending Ladder Editor 32NX

7.1 How to start

To start up Ladder Editor 32NX, open the [Start] menu in the Windows tool bars, and select "Ladder Editor 32NX" from [Program] – [Motoman] – [Ladder Editor 32NX].

When this application is initially started up or when the [Manage type] is set to "Easy Mode", the [Enter Password] dialog box for the Easy Mode (Fig. [Enter Password] Dialog Box for Easy Mode) appears. When the [Manage type] is set to "Standard Mode", the [Enter Password] dialog box for the Standard Mode (Fig. [Enter Password] Dialog Box for Standard Mode) appears. (For details on managing user accounts, refer to "User information management".)

Fig.6 [Enter Password] Dialog Box for Easy Mode

Fig.7 [Enter Password] Dialog Box for Standard Mode

If the "Require Password to Start Ladder Editor" check box is cleared in the [User Manager] dialog box, these dialog boxes for inputting passwords do not appear.

The "Default User Names and Password List" managed and stored by the software administrator describes the "Login Name" and "Password". This list is included with the shipment.

Input the password, and the "Startup" display for Ladder Editor 32NX appears as shown in Fig. ""Startup" Display" appears.

.

Fig.8 "Startup" Display

7.2 How to end

Selecting [File] – [Exit] in the Ladder Editor 32NX menu can close the Ladder Editor 32NX.

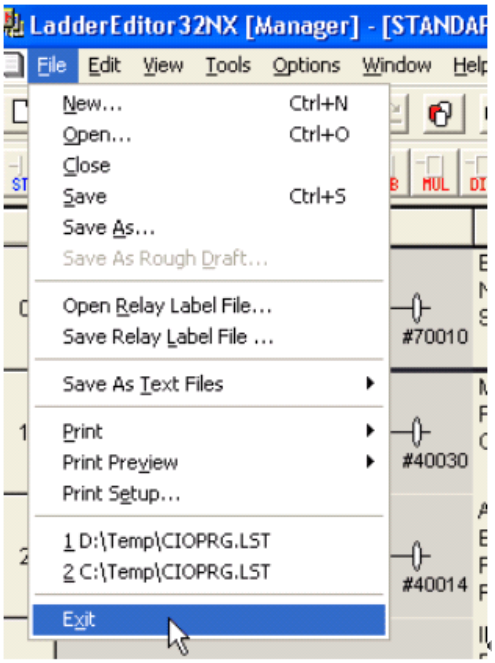


Fig.9 Exit Menu

8. Reading and storing edited ladder files

8.1 Reading Ladder Data

To perform ladder editing, read in the ladder program to be edited by Ladder Editor 32NX.

The following two types of files can be edited by Ladder Editor 32NX:

✔ Ladder program file (text file)

✔ CMOS file (binary file)

How to operate

1) Selecting [File] – [Open] menu (or button) opens the [Open] dialog box.

Fig.10 [Open] Dialog Box

2) To read in a ladder program file, select the ladder program file and click the [Open] button.
To read in a CMOS file, select "CMOS file (*.HEX)" from [Files of type] combo box in [Open] dialog box in Fig. "[Open] dialog box". When the list of CMOS. HEX files appears, select the CMOS file to be edited, and click the [Open] button.

8.2 Reading several ladder files

The Ladder Editor 32NX is an MDI (Multi Document Interface) application to read in several ladder program files simultaneously. To select the ladder program to be edited, select the file name displayed in the [Window] menu, or select the window with the targeted ladder program among overlapped windows by selecting [Window] - [Cascade].

.

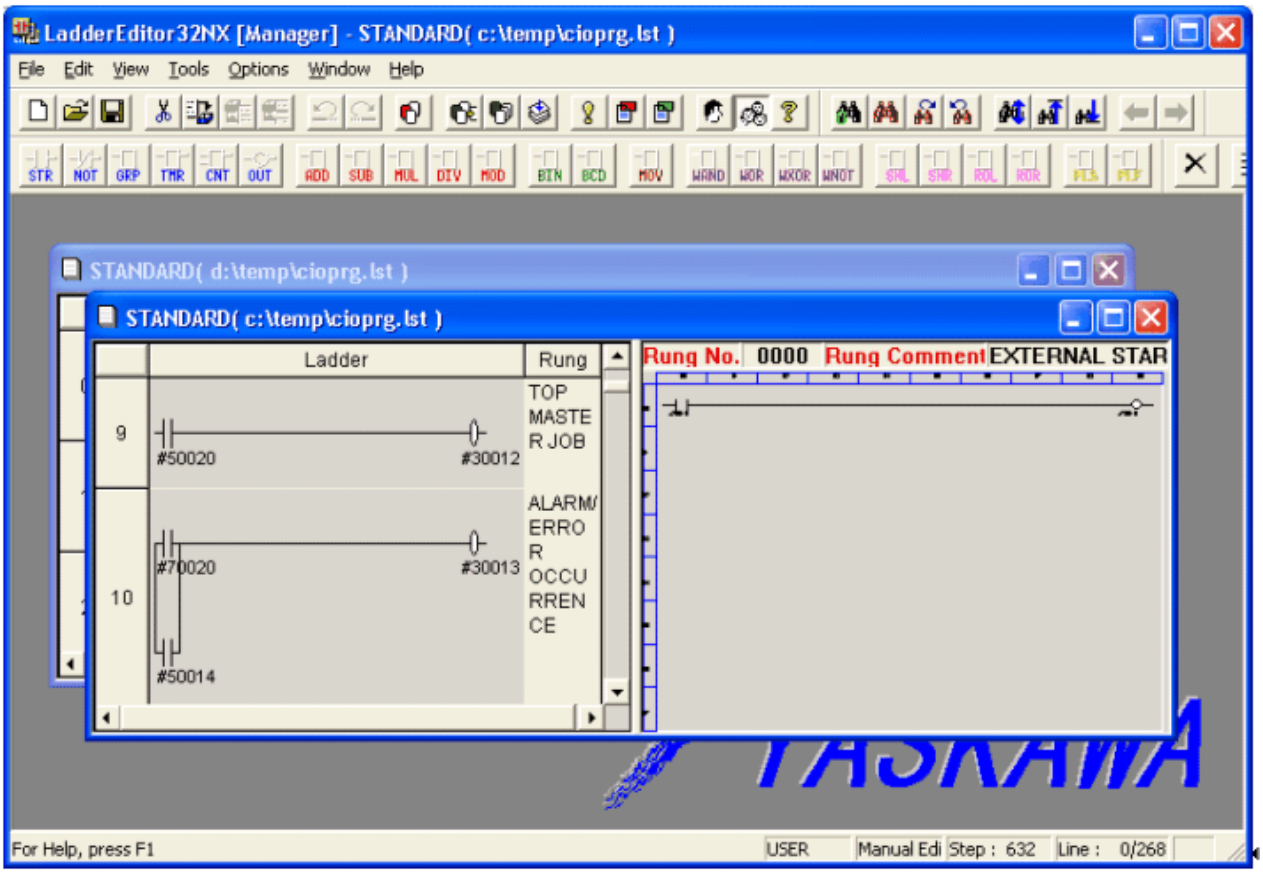


Fig.11 "Editing Window Overlapped" Display

8.3 Storing edited data

When ladder editing is completed, store the information in a file. **Before storing, compile the data when a ladder was edited by Ladder Editor 32NX.**
Unless compiled, data may not be stored completely.

How to Operate

1) Selecting [File] – [Save] stores the overwritten data on an existing file.

2) Selecting [File] – [Save As] displays the [Save As] dialog box. Set an arbitrary file name to the data to be stored.

To store the file, the following three types of file forms are available, depending on the method used to read in a file.

a) Storing when a Ladder Program File (CIOPRG.LST) is Open.
When a ladder program file is read in, only a ladder program file (text file) can be stored in an output file form.

b) Storing when a CMOS File (CMOS.HEX) is Open.
When a CMOS file is read in, the data can be stored in the two types of file forms, a ladder program file (text file) and a CMOS file (binary file), as an output file.

c) Storing a Ladder Program that is Being Edited.
A ladder program being edited cannot be stored if it has a detected error, even if compiled. The ladder program being edited can be stored as a work file. For details, refer to paragraph "Rough Draft File Forced Output Function".

9. Creating a ladder diagram

To create a new ladder program, use the standard ladder program as the base for editing. The standard ladder program is supplied as a template.

How to Operate

1) Selecting [File] – [New] displays the dialog box shown in fig.

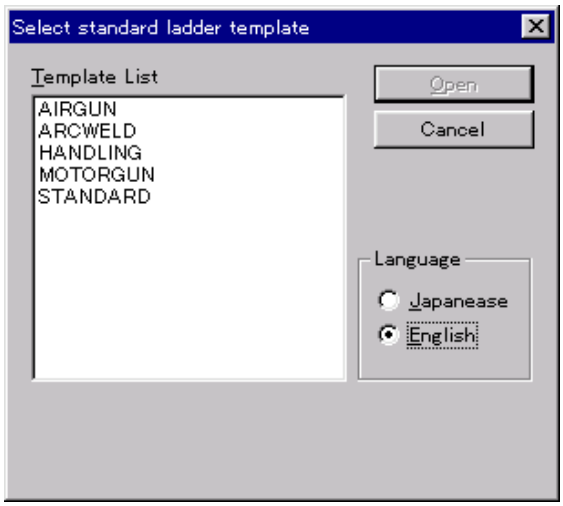


Fig.12 [Select standard ladder template] Dialog Box

2) Select the template to be set and click the [Open] button.

10. Editing a ladder diagram

All ladder diagrams are edited in the "Basic" Display shown in fig. ""Ladder Preview" display".

10.1 Ladder parts specifications

The Ladder Editor 32NX supports the ladder parts corresponding to the new ladder codes employed for the NX100.

For the details on such ladder parts, refer to the [Ladder Parts Specifications] of [Help] menu.

10.2 Selecting a ladder edited line

A ladder diagram is edited in the "ladder editing" display, and the line to be displayed in the "ladder editing" display is selected in the "ladder preview" display (Fig. below). In the "ladder preview" display, images of the ladder diagrams of all the lines can be viewed set in the current ladder section (either system section or user section).

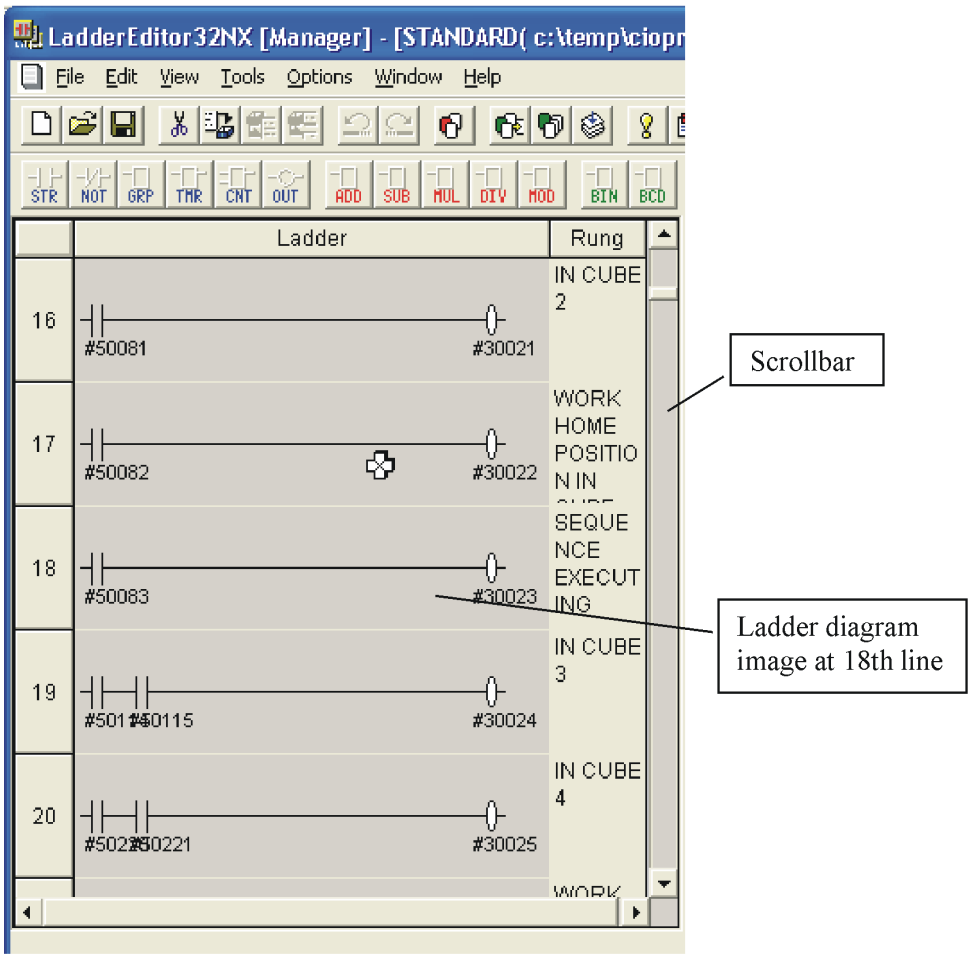


Fig.13 "Ladder preview" display

To refer to the ladder image of a line that is not displayed on the display, scroll using the scroll bar.

In the "ladder preview" display, right-click the mouse to select the line to be edited and the "ladder editing" display with the ladder diagram of the selected line will appear.

10.3 Adding new ladder parts

New ladder parts can be added when editing a ladder diagram.
Add ladder parts in the following manner.

How to operate

1) Enter the parts addition mode (select parts to be added).
Selecting [Tool] – [Add Instructions] displays the list of ladder parts to be added. Then select the ladder parts. Or select the parts to be added from the ladder parts tool bar (refer to the paragraph "Ladder Parts Tool Bar").

✔ **Example)** Adding the ladder parts of the NC contact

Select [Tool] – [Add Instructions] – [STR-NOT], or tool bar

.

2) Paste new parts on the matrix to be added in the "ladder editing" display.
When the ladder parts to be added are determined, the mouse form changes in the "ladder editing" display. The selected ladder parts appear at the side of the mouse pointer. **Left-click** on the matrix location where the ladder parts are to be added.

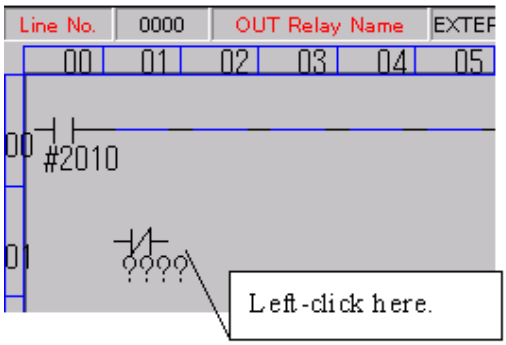


Fig.14 Addition of ladder parts

"????" may appear for the added ladder parts. This is because the relay No. or register No. is not set for these ladder parts, and it is not an error. Set the relay No. or register No.. For the setting of the relay Nos. or register Nos., refer to the paragraph "Setting Relay No., Register No. and Constants".

10.4 Deleting ladder parts

Delete the ladder parts in the following manner.

How to operate

1) Enter the parts deletion mode.
Select [Tool] – [Edit Instructions] – [Delete Instructions], or select from the parts control tool bar (refer to "Parts Control Tool Bar").

2) Select the ladder parts to be deleted in the "ladder editing" display.
Left-click on the matrix location where the ladder parts are to be deleted in the "ladder editing" display.

10.5 Connecting and disconnecting lines between ladder parts

Ladder parts on a certain matrix are connected to ladder parts on another matrix with a line. The connection method of the line determines the ladder process. The following paragraph describes how to connect and disconnect the line between ladder parts.

10.5.A Connecting with a Line

Connect ladder parts with a line in the following manner.

How to operate

1) **Left-click** the mouse on the first ladder part.
2) While pressing the mouse, drag the mouse to the second ladder part.
3) Release the **left button** at the second ladder part.
   Two parts are connected by a drag and drop operation.

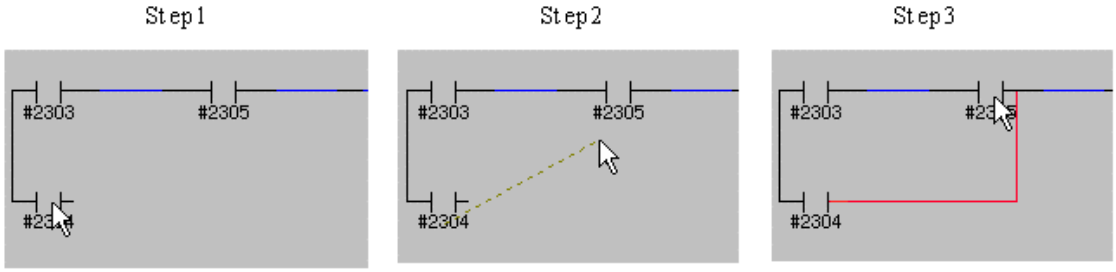


Fig.15 Line connection process

■ *Ladder parts connection terminals*

Ladder parts have IN and OUT terminals. A connecting line connects the IN and OUT terminals. A drop and drag operation determines which are IN and which are OUT terminals and connects them automatically.

However, when two connection ladder parts are placed vertically as shown in Fig. below, the user must decide to connect the IN or OUT side.

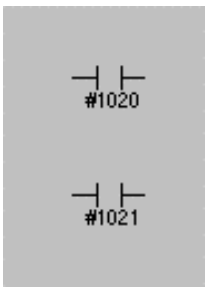


Fig.16 When parts are placed vertically

In Fig. "Connection on inside", the mouse pointer is dragged from the center of a ladder part and dropped on the IN side of the other part, to make the connecting line on the IN side.

Dropping on the IN side makes a line which connects to the IN side of the other ladder part. On the other hand, dropping on the OUT side makes a line which connects to the other OUT side.

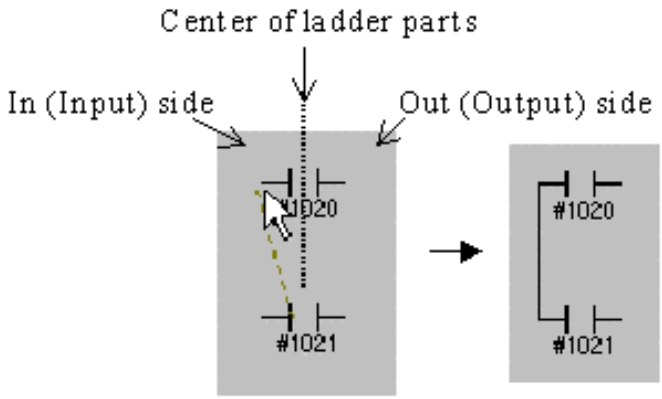


Fig.17 Connection on IN side

10.5.B Disconnecting two parts

Erase the line between ladder parts to disconnect them in the following manner.

How to operate

1) Right-click the mouse on the first ladder part.

2) While pressing the mouse, drag the mouse to the second ladder part.

3) Release the **right button** at the second ladder part.
Two parts are disconnected by a right-click, drag and drop operation.

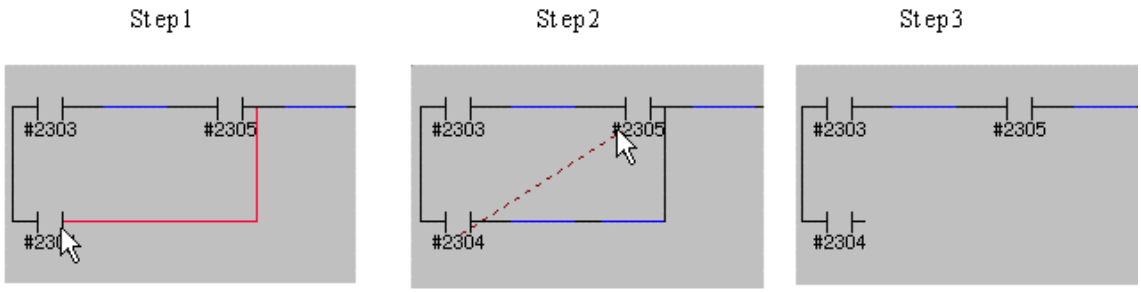


Fig.18 Disconnection Process

10.6 Setting relay no., register no. and constants

Relay No., register No. and constants can be set for each ladder parts. Set these values in the following manner.

How to operate

1) Enter the set value input mode.
Select [Tool] – [Edit Instruction] – [Edit Instruction Parameters], or select No. - from the parts control tool bar (refer to paragraph "Parts control tool bar").

2) Select the ladder parts to which the set values are input in the "ladder editing" display.
Left-click the mouse on the ladder parts in the "ladder editing" display, and the "set value input" dialog box appears.

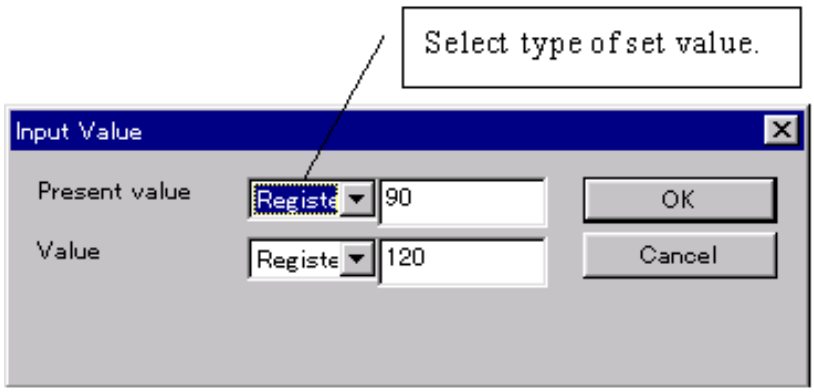


Fig.19 [Input Value] Dialog Box

Note!
The number of setting items in the [Input Value] dialog box differs depending on the ladder parts.

3) Input the set values.
Select the type of the set value in the combo box of the [Input Value] dialog box, and then input a value suitable for the type of the set value.
Click the [OK] button to set the values.

■ Setting Values Using a Pop-up-Menu

Set values can also be set in the following manner using a pop-up menu. The pop-up menu appears by right-clicking the mouse.

How to operate

1) Right-click the mouse on the ladder parts to which the set values are input.
Right-click the mouse on the ladder parts to which the set values are input in the "ladder editing" display, and the pop-up menu appears. Select the [IEdit Instruction Parameters], and the [Input Value] dialog box appears.

2) Input the set values.
Input the set values in the [Input Value] dialog box.

10.7 Inputting relay no. and register no. names

Names can be set for the relay Nos. and register Nos.. When editing name, a new name can be input or name information read from the external name file can be edited. Set the name for a relay No. or a register No. in the following manner.

How to operate

1) Enter the name input mode.
Select [Tool] – [Edit Instruction] – [Edit Instruction Parameters], or select from the parts control tool bar (refer to "Parts control tool bar").

2) Select the ladder parts where the number of the name to be selected is set.
Left-click the mouse on the ladder parts where the number of the name to be selected is set in the "ladder editing" display, and the [Edit Lables and Comments] dialog box appears.

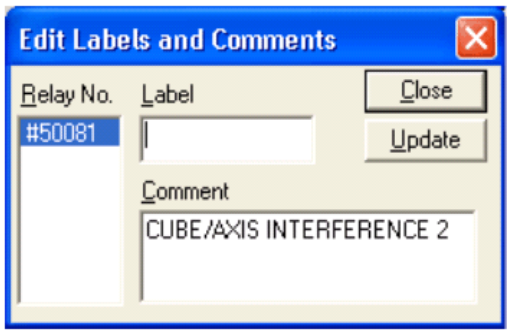


Fig.20 [Edit Lables ans Comments] Dialog Box

The relay No. or register No. appears in the No. selection list box as shown below.

✔ Relay No. : #xxxx, W#xxxx

✔ Register No. : Mxxx

Note!
Some ladder parts have several relay Nos. or register Nos. In such a case, several numbers appear in the No. selection list box.

Verify that the targeted relay Nos. or register Nos. appear and are selected in the relay No. selection list box.

3) Set the name.
Two types of names, a short name and a long name can be used. They are treated as follows with Ladder Editor 32NX.

Short name:	Appears overlapped on the relay No. or register No. of the ladder diagram in the "ladder editing" display. (Refer to "Switching short name display/non-display".)
Long name:	Appears in the column of OUT relay names in the "ladder editing" display, and in the row of output signal names in the "ladder preview" display.

When setting is completed, be sure to click the [Update] button. This button records the setting information.

■ *Setting names using a pop-up-menu*

Names can be also set in the following manner using the pop-up menu.

How to operate

1) Select the ladder parts where the relay No. or register No. of the name to be edited is set.
Right-click the mouse on the ladder parts where the relay No. or register No. of the name to be edited is set in the "ladder editing" display, and the pop-up menu appears. Select the [Edit Lables and Comments], the [Edit Lables and Comments] dialog box appears.

2) Edit the name.
Edit the displayed name for a relay No. or register No. in the [Edit Lables and Comments] dialog box.

10.8 Inserting editing matrix row and line

Even though new ladder parts are to be inserted immediately before the ladder parts that have already been set, there may be no matrix for insertion as shown in the following diagram.

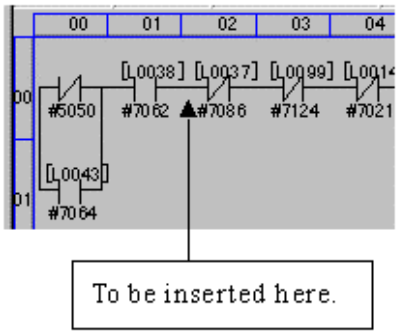


Fig.21 When no space for matrix

In this case, insert a line (or a row) to secure the matrix where the ladder parts are to be inserted.

10.8.A Inserting a row

Insert a row in the following manner.

How to operate

1) Enter the row insertion mode.
Select [Tool] – [Edit Instructions] – [Edit Entire Row] – [Insert Row].
Or select from the parts control tool bar (refer to "Parts Control Tool Bar").

2) Specify the matrix where a row is to be inserted.
Left-click the mouse on the matrix where a row is to be inserted.

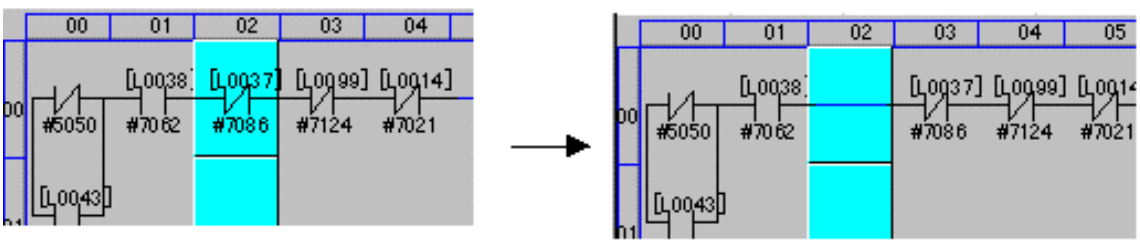


Fig.22 Result of Row Insertion

■ *Row insertion disabled pattern*

A row cannot be inserted if even one part exists in the column just before the last column on the right after the second line of the matrix in the "ladder editing" display.

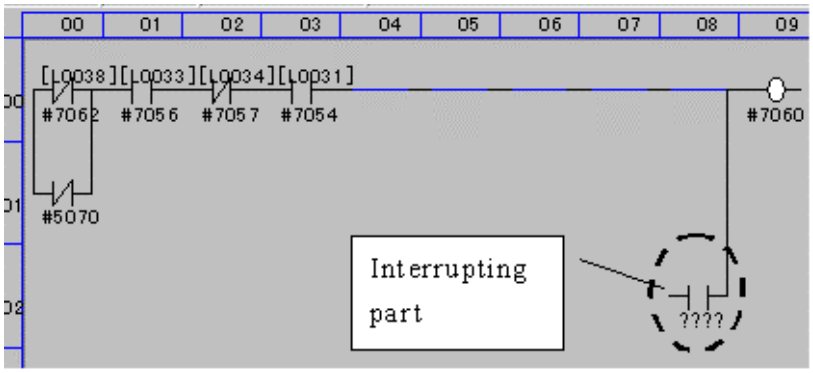


Fig.23 Disabled row insertion

10.8.B Inserting a Line

Insert a line in the following manner.

How to operate

1) Enter the line insertion mode.
Select [Tool] – [Edit Instructions] – [Edit Entire Column] – [Insert Column].

Or select from the parts control tool bar (refer to "Parts Control Tool Bar").

2) Specify the matrix where a line is to be inserted.
Left-click the mouse on the matrix where a line is to be inserted.

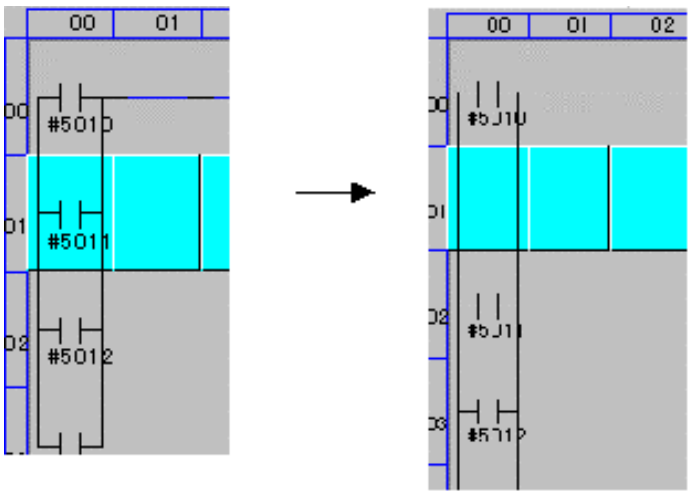


Fig.24 Result of line insertion

■ *Line insertion disabled pattern*

A line cannot be inserted if even one part exists in the lowest line of the matrix in the "ladder editing" display.

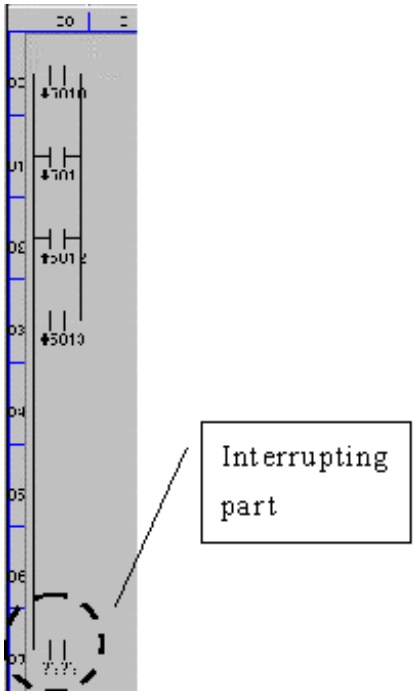


Fig.25 Disabled line insertion

10.9 Deleting Editing Matrix Row and Line

Unnecessary rows or lines can be deleted.

10.9.A Deleting a Row

Delete a row in the following manner.

How to operate

1) Enter the row deletion mode.
Select [Tool] – [Edit Instructions] – [Edit Entire Row] – [Delete Row].

Or select from the parts control tool bar (refer to "Parts control tool bar").

2) Specify the matrix where a row is to be deleted.
Left-click the mouse on the matrix where a row is to be deleted.

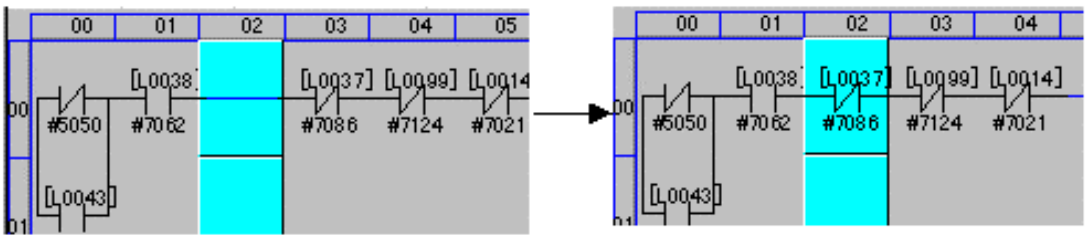


Fig.26 Result of row deletion

Note!
Deletion of a row deletes all the ladder parts that are set to the row to be deleted.

10.9.B Deleting a Line

Delete a line in the following manner.

How to operate

1) Enter the line deletion mode.
Select [Tool] – [Edit Instructions] – [Edit Entire Column] – [Delete column].

Or select from the parts control tool bar (refer to "Parts control tool bar").

2) Specify the matrix where a line is to be deleted.
Left-click the mouse on the matrix where a line is to be deleted.

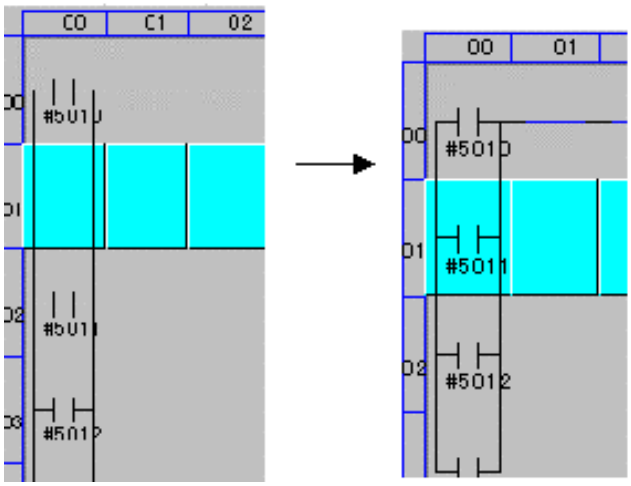


Fig.27 Result of line deletion

Note!
Deletion of a line deletes all the ladder parts set to the line to be deleted.

10.10 Clearing Displays

The contents of the "ladder editing" display can be cleared when editing. This function is useful when the current display is to be reedited from the beginning.

How to operate

Select [Edit] – [Clear Current Rung]. Or select from the parts control tool bar (refer to " Parts Control Tool Bar").

11. Inserting a new line

A new line is inserted into an arbitrary line. Since default values are set to the new line, change the values to the correct ladder information.

The new line is inserted into the next line of the line selected in the ladder preview display.

How to operate

1) Select [Edit] – [Insert new Rung], or select from the main tool bar (refer to "Main tool bar").

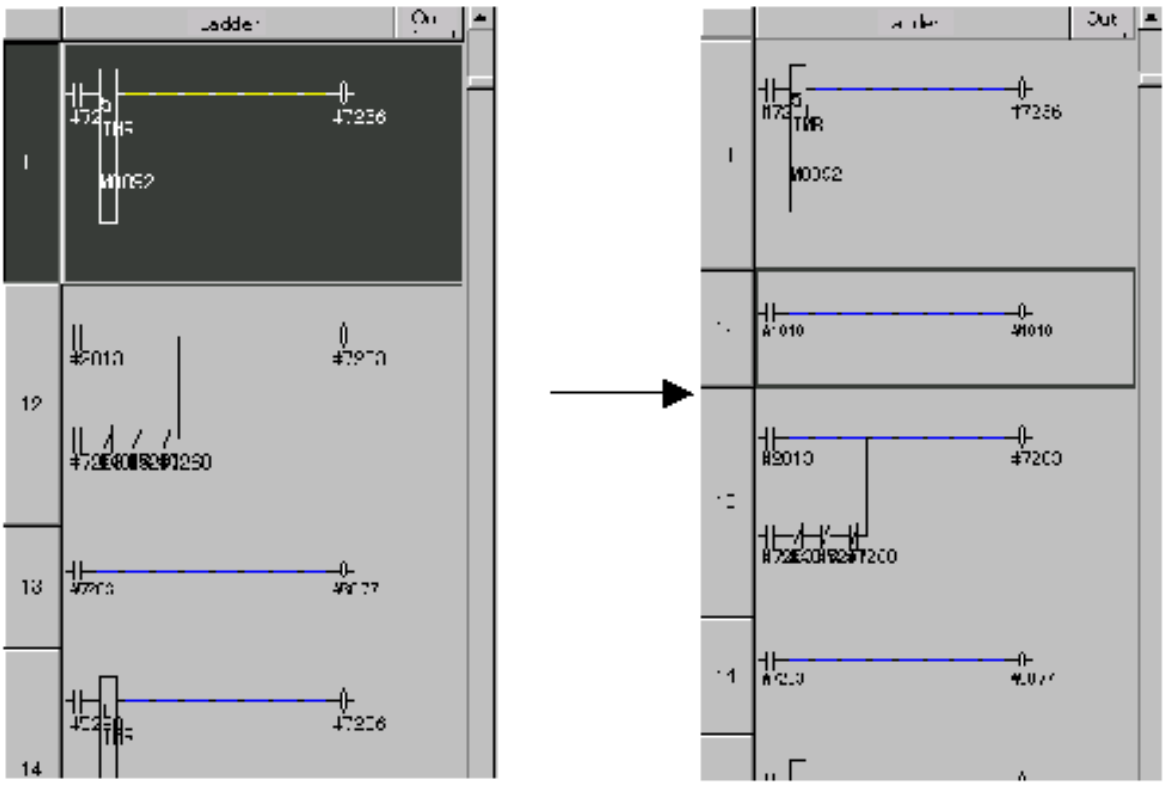


Fig.28 Inserting new line

12. Line operation of ladder diagram

Be sure to select [Overwrite] or [Insert] for the contents edited in the "ladder editing" display before editing another line. Without this operation, the contents edited immediately before will be deleted. Ladder Editor 32NX checks the ladder information that is being currently edited when another line appears. If the [Overwrite] or [Insert] is not selected, an editing confirmation message appears. (Refer to "Automatic updating function".)

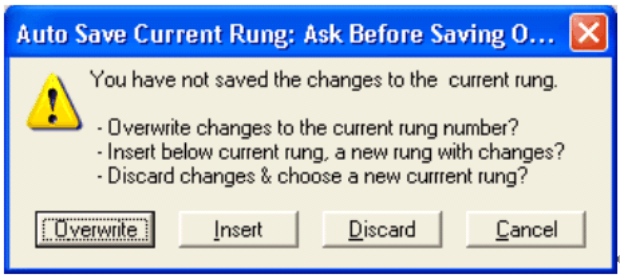

Auto Save Current Rung: Ask Before Saving O...
You have not saved the changes to the current rung.
- Overwrite changes to the current rung number?
- Insert below current rung, a new rung with changes?
- Discard changes & choose a new current rung?
Overwrite
Insert
Discard
Cancel

Fig.29 [Autosave Current Rung: Ask Before Saving Options] Dialog Box

Normally, the operator uses the menu or tool button to perform [Line Alt] or [Line Insert].

12.1 Changing an edited ladder line

Overwrite the contents edited in the "ladder editing" display on the line currently being edited, in the following manner.

How to operate

1) Select [Edit] – [Save Current Rung] – [Overwrite], or select from the main tool bar (refer to "Main tool bar").

12.2 Inserting an Edited Ladder Line

Insert the contents edited in the "ladder editing" display into the next line of the line currently being edited, in the following manner. Therefore, the ladder data after the inserting line will be shifted backward.

How to operate

1) Select [Edit] – [Save Current Rung] – [Insert], or select from the main tool bar (refer to "Main tool bar").

13. Cutting, copying and pasting lines

13.1 Cutting a ladder diagram line

Cut the line selected in the "ladder preview" display. The ladder information of the cut line can be pasted to another line by pressing [Paste Rung] or [Insert Cut/ Copied Rung].

How to operate

1) Select the line to be cut in the "ladder preview" display, and select [Edit] – [Cut Rung]. Or select from the main tool bar (refer to "Main tool bar").

2) To select several lines simultaneously, hold down the [SHIFT] or [CTRL] key when selecting lines.

13.2 Copy a ladder diagram line

Copy the line selected in the "ladder preview" display.
The ladderinformationof the copied line can be pasted onto another line by pressing [Paste Rung] or [Insert Cut/Copied Rung].

How to operate

1) Select the line to be copied in the "ladder preview" display. Then select [Edit] – [Copy Rung] menu. Or select from the main tool bar (refer to "Main tool bar").

2) To select several lines simultaneously, hold down the [SHIFT] or [CTRL] key when selecting lines.

13.3 Pasting a ladder diagram line

Paste the cut or copied contents of the line by pressing [Cut Rung] or [Copy Rung] over the line selected in the "ladder preview" display.

When several ladder list files are open simultaneously, the ladder diagram can be pasted onto another ladder list file.

How to operate

Select the line to be pasted in the "ladder preview" display, and select [Edit] – [Paste Rung]. Or select from the main tool bar (refer to "Main tool bar").

Note!
This function is disabled if several lines were cut or copied by pressing [Cut] or [Copy] in the operation immediately before. After selecting only one line and pressing [Cut Rung] or [Copy Rung], try pasting again.

13.4 Inserting and pasting a ladder diagram line

Insert the cut or copied contents of the line into the line selected in the "ladder preview" display. Therefore, the ladder data after the inserting/pasting line will be shifted backward.

When several ladder list files are open simultaneously, the ladder diagram can be inserted and pasted onto another ladder list file.

How to operate

1) Select the line to be inserted and pasted in the "ladder preview" display. Then select [Edit] – [Insert Cut/Copied Rung]. Or select from the main tool bar. (Refer to "Main tool bar").

14. Compiling edited contents

Be sure to compile the ladder information of each line after editing.

Compiling performs final checking such as the relay No. overlapping check, etc. to load the information to the controller.

How to operate

Select [Edit] – [Check the Ladder], or select from the main tool bar. (Refer to "Main Tool Bar").

Note!

Without this operation, the edited data cannot be correctly stored.

Since compiling processes the system section and the user section of the ladder program, it is unnecessary to change to a system ladder or a user ladder.

15. Printing

15.1 Printing a ladder diagram

Print an image of a ladder diagram. For the ladder program to be printed, the line Nos. of other lines referring to the OUT terminal relay Nos. appear.
The information of the reference lines appears as the system section and user section together.

How to Operate

1) Select [File] – [Print] – [Ladder Diagram] – [System Section (or User Section)].

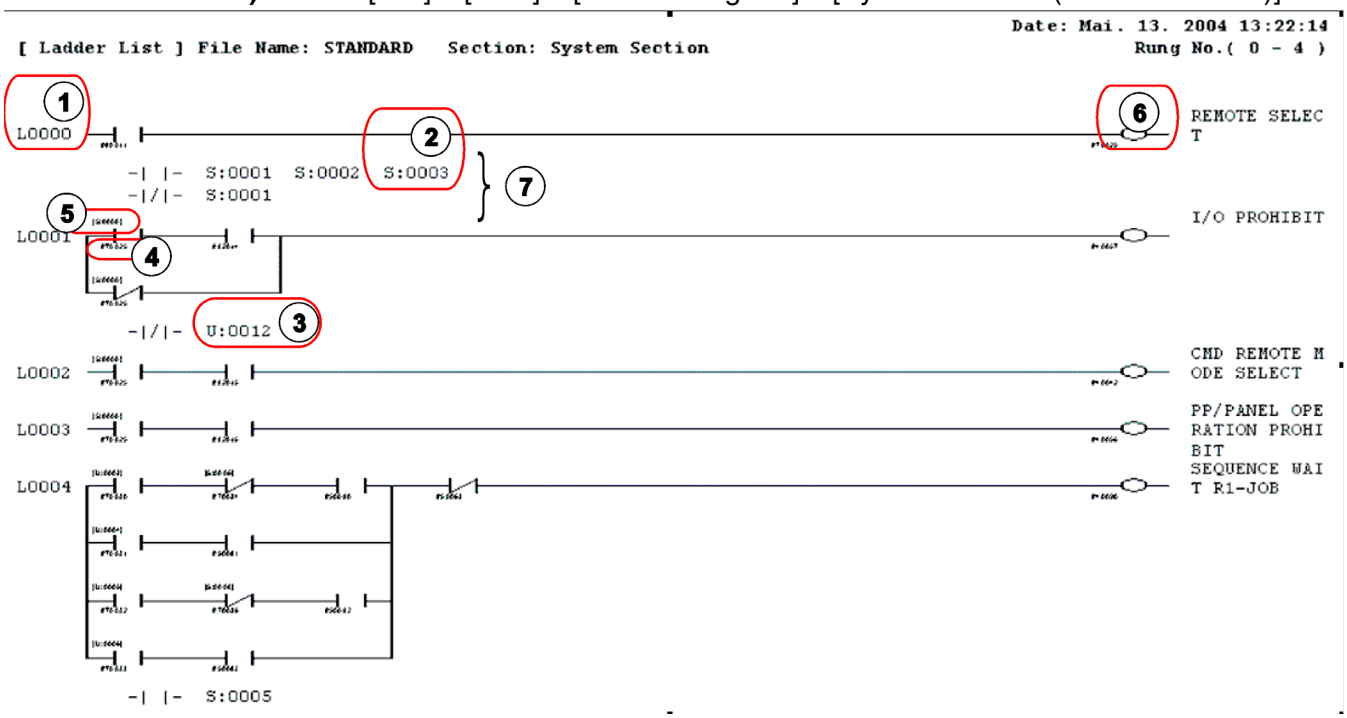


Fig.30 Ladder image printing

1 Rung No.
2 System section rung number
3 User section rung number
4 Input relay
5 Rung No that contains ladder information of this input relay
6 Output relay
7 List of rung No. unsing this output relay as input relay and usage category

15.2 Printing relay no. using list

Print the list of used relay Nos. and the line Nos. referring to each relay No. in a list. List information of the reference lines appears as the system section and user section together.

How to operate

1) Select [File] – [Print] – [Relay List] – [System Section (or User Section)].

```
                                                    Date: Mai. 13. 2004 13:26:28
[ Relay No. List ] File Name: STANDARD   Section: System Section   Relay No.( 40042 - 50012 )

No.   Symbol   Relay Label
#40042 (1)             CMD REMOTE MODE SELECT
     -( )-   S:0002

#40044                 EXTERNAL START (3)
     -( )-   S:0012

#40056                 PP/PANEL OPERATION PROHIBIT
     -( )-   S:0003

#40057                 I/O PROHIBIT
     -|/|-   U:0012
     -( )-   S:0001 (2)

#40090                 SEQUENCE WAIT R1-JOB
     -| |-   S:0005
     -( )-   S:0004

#40570                 WORK START RESPONSE
     -( )-   S:0017

#40571                 WORK END RESPONSE
     -( )-   S:0018

#40572                 WORK TIME MEASURE
     -( )-   S:0020
```

Fig.31 Printing relay no. list

1 Relay number
2 List of Rung No. using this relay
3 Relay name

15.3 Printing register no. using list

Print the list of used register Nos. and line Nos. referring to each register No. in a list. List information of the reference lines appears as the system section and user section together.

How to Operate

1) Select [File] – [Print] – [Register List] – [System Section (or User Section)].

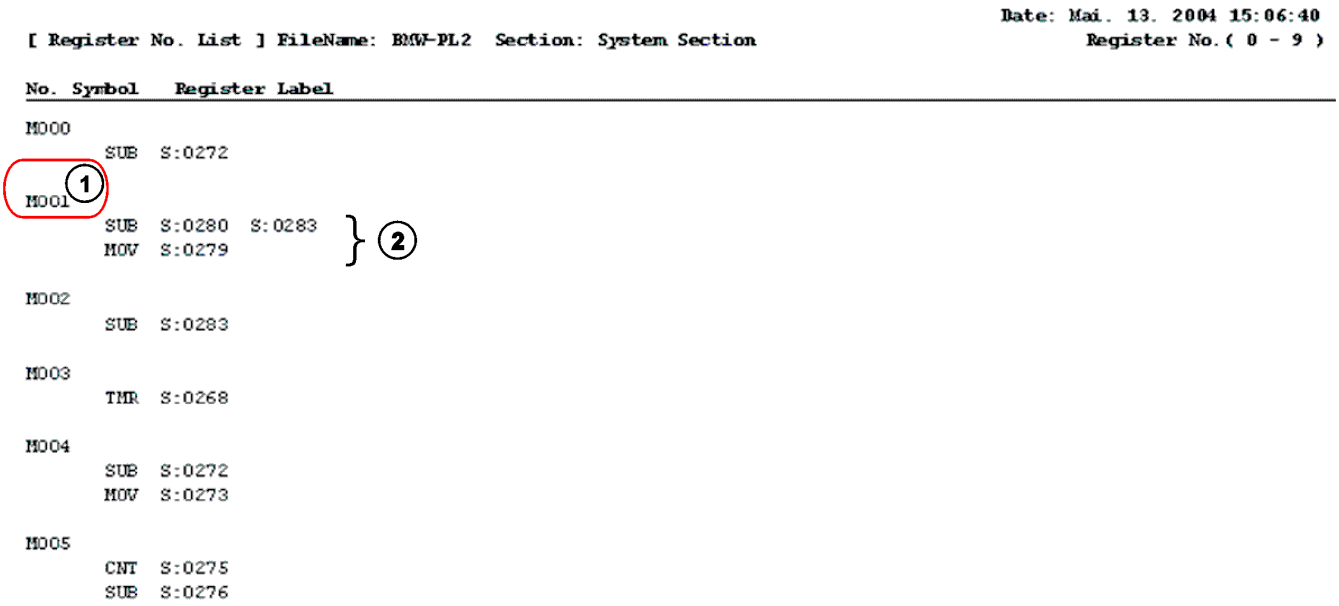


Fig.32 Printing register no. list

1 Register No.
2 Rang No. using this register and usage category

15.4 Printing relay no. use state

Print the relay No. use state in the "matrix" display.

How to Operate

1) Select [File] – [Print] – [Relay State Table].
Relay Nos. for the system section and user section appear together, indicated by the following symbols.

✔ S: Relay Nos. used in a system section

✔ U: Relay Nos. used in a user section

✔ B: Relay Nos. used in both system and user sections

2) A relay No. in a matrix is regarded as YYYYYX when the vertical is "YYYYY" and the horizontal axis value is "X".

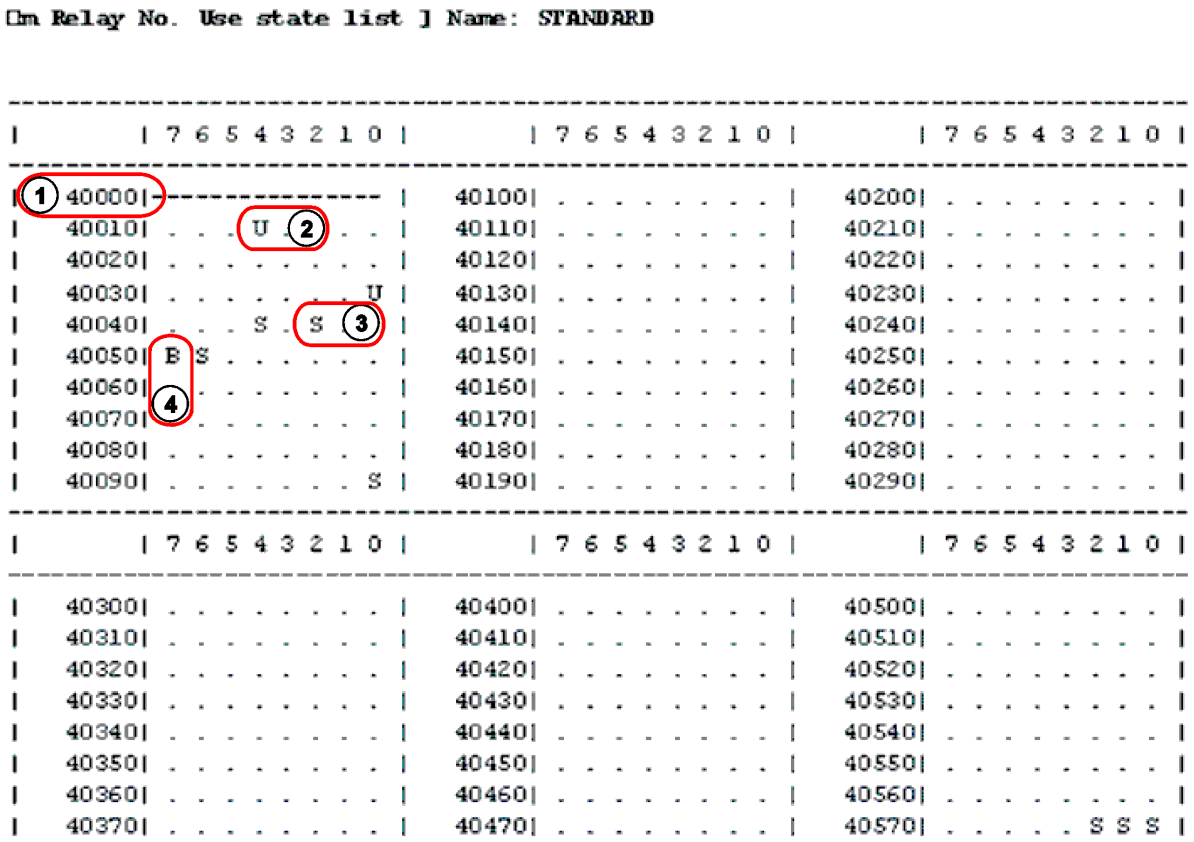


Fig.33 Printing relay no. use state

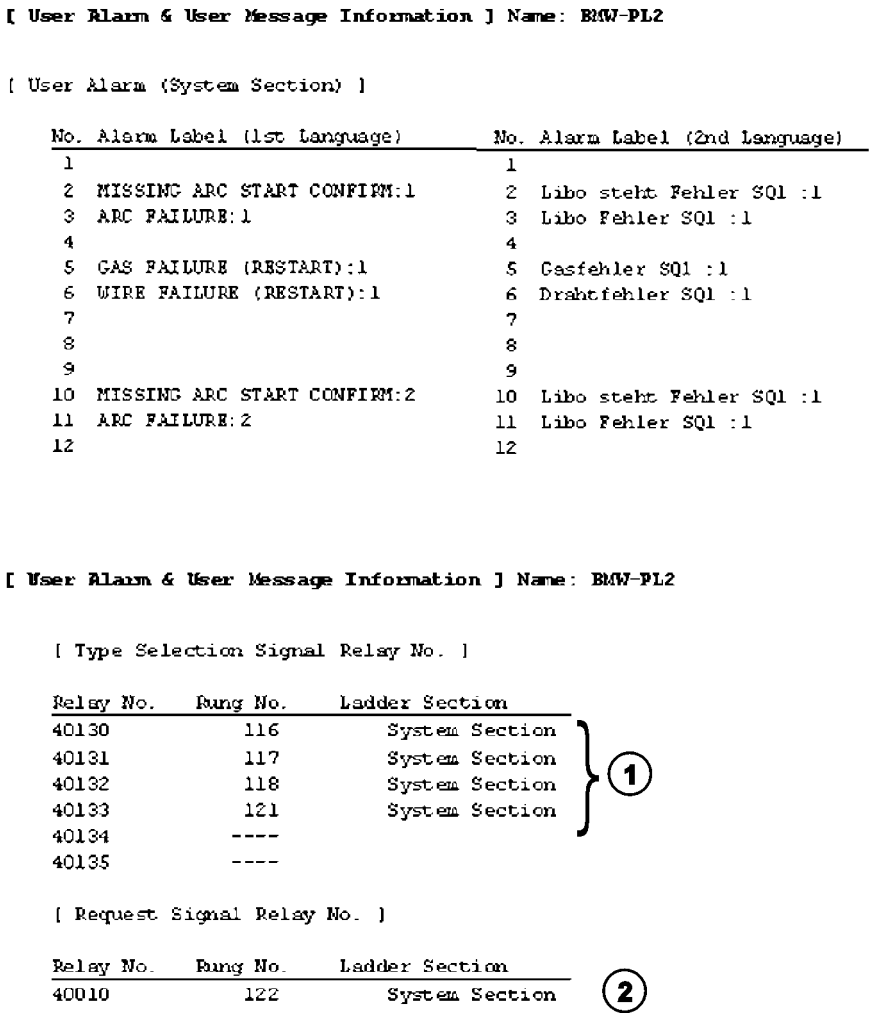
1 Relay No.
2 Used in an user section
3 Used in a system section
4 Used in both sections

15.5 Printing User Alarms and User Messages

Print the lists of user alarms and user messages.

How to operate

Select [File] – [Print] – [Alarms and Messages].



[User Alarm & User Message Information] Name: BMW-PL2

[User Alarm (System Section)]

No.	Alarm Label (1st Language)	No.	Alarm Label (2nd Language)
1		1	
2	MISSING ARC START CONFIRM:1	2	Libo steht Fehler SQ1 :1
3	ARC FAILURE:1	3	Libo Fehler SQ1 :1
4		4	
5	GAS FAILURE (RESTART):1	5	Gasfehler SQ1 :1
6	WIRE FAILURE (RESTART):1	6	Drahtfehler SQ1 :1
7		7	
8		8	
9		9	
10	MISSING ARC START CONFIRM:2	10	Libo steht Fehler SQ1 :1
11	ARC FAILURE:2	11	Libo Fehler SQ1 :1
12		12	

[User Alarm & User Message Information] Name: BMW-PL2

[Type Selection Signal Relay No.]

Relay No.	Rung No.	Ladder Section	
40130	116	System Section	1
40131	117	System Section	
40132	118	System Section	
40133	121	System Section	
40134	----		
40135	----		

[Request Signal Relay No.]

Relay No.	Rung No.	Ladder Section	
40010	122	System Section	2

1 User alarm selection Relay No. information

2 User Alarm display Relay No. information

[User Alarm & User Message Information] Name: BMW-PL2

[User Alarm (User Section)]

No.	Alarm Label (1st Language)	No.	Alarm Label (2nd Language)
65		65	
66		66	
67		67	
68		68	
69		69	
70		70	
71		71	
72		72	
73		73	
74		74	
75		75	
76		76	
77		77	
78		78	
79		79	
80		80	

[User Alarm & User Message Information] Name: BMW-PL2

[Type Selection Signal Relay No.]

Relay No.	Rung No.	Ladder Section
40140	----	
40141	----	
40142	----	
40143	----	
40144	----	
40145	----	

[Request Signal Relay No.]

Relay No.	Rung No.	Ladder Section
40012	----	

The following describes the items of printed information. User alarms and user messages can be printed. Since each display item is the same, this paragraph describes printing of the user alarm list as an example.

■ *User alarm system section and user section*

A user alarm can be roughly classified as a system section that the system uses or a user section that the user can define freely. When printing, this information appears as the following word.
[User Alarm(**** Section)]**

■ *User alarm selection relay no. information*

Relay No. information is displayed to help select a used user alarm. A user alarm is specified by turning the following four relays ON/OFF.

40130, 40131, 40132, 40134, 40135

When printing, this information appears as the following word:
[Type Selection Signal Relay No.]
When each relay No. is actually used in a code, the line No. appears:

■ *User alarm display relay no. information*

Relay No. information which becomes a trigger to help display a user alarm appears. The relay No. that becomes a display trigger is 40010.
When printing, this information appears with the following word.
[Request Signal Relay No.]
When each relay No. is actually used in a code, the line No. appears.

16. Transferring printing information to a text file

16.1 Transferring Ladder Diagrams to a Text File

Transfers an image of a ladder diagram to a text file.

[How to Operate]

Select [File] – [Save asText Files] – [Ladder Diagram] – [System Section (or User Section)].

16.2 Transferring Used Relay No. Lists to a Text File

Transfers the lists of relay Nos. used and the line Nos. referring to each relay No. to a text file. The system section and the user section are transferred together in the list of reference lines.

[How to Operate]

Select [File] – [Save asText Files] – [Relay List] – [System Section (or User Section)].

16.3 Transferring Used Register No. Lists to a Text File

Transfers the lists of register Nos. used and the line Nos. referring to each register No. to a text file. The system section and the user section are transferred together in the list of reference lines.

[How to Operate]

Select [File] – [Save asText Files] – [Register List] – [System Section (or User Section)].

16.4 Transferring Relay No. Use State to a Text File

Transfers the relay number use state to the text file in a "matrix" display.

[How to Operate]

Select [File] – [Save asText Files] – [Relay State Table].

16.5 Transferring User Alarms and User Messages to a Text File

Transfers the user alarms and user messages to a text file.

[How to Operate]

Select [File] - [Save asText Files] - [Alarms and Messages]

17. Header information

17.1 Ladder name and system register editing

Edit the ladder program names and system registers.

How to Operate

1) Select [View] – [Header Information], or select from the main tool bar. (Refer to "Main tool bar").

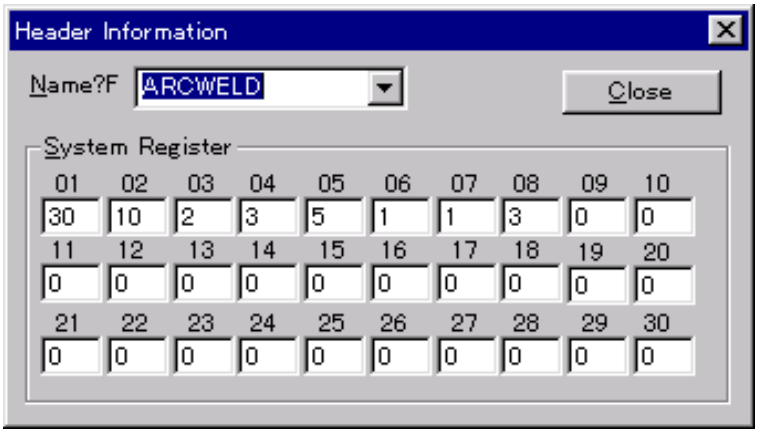


Fig.36 [Header information] dialog box

a) [Name] combo box.
Selects a ladder name. Normally, select one from the list in the combo box. A name can be entered directly. However, an improper name interrupts the loading to the controller.

b) System registers.
Sets the number of system registers.

18. User alarm and user message information

Edit the user alarms and user messages.

How to Operate

1) Select [Edit] – [Alarms and Messages], or select from the main tool bar. (Refer to "Main Tool Bar").

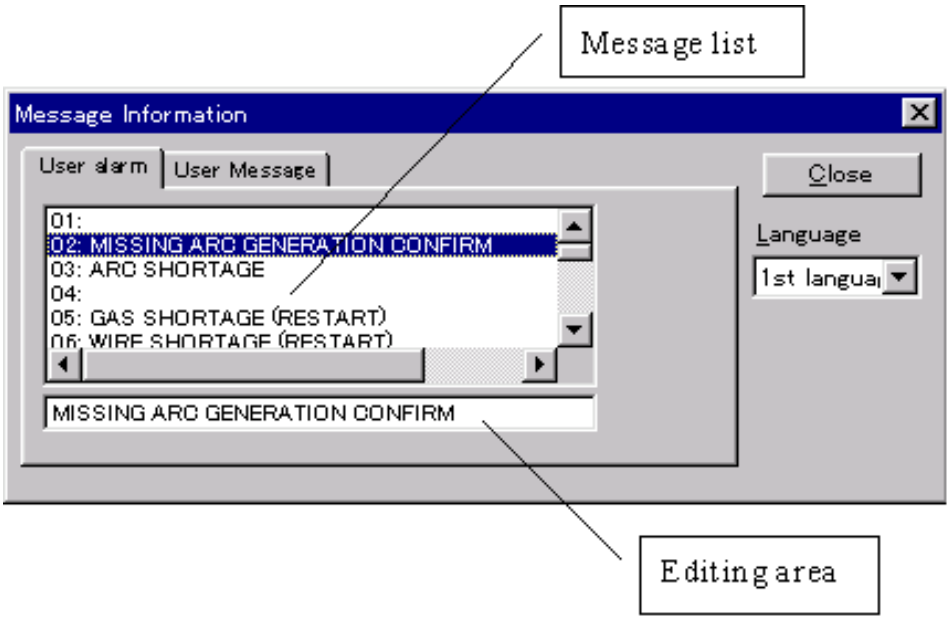


Fig.37 [Message Information] Dialog Box

Click the tag to select the user alarm and user message.

■ ***Language combo box***

Each message has a first and a second languages. Select your desired language from the language combo box.

■ ***Editing aera***

Click the message to be edited in the message list, and the same message appears in the editing area. Edit the message in this area. When editing is completed, press the [Change] button.

18.1 User alarm and user message in system section

If the user account level does not reach the management level, only the information in the user section appears in the message list. To display or edit the information in the system section, change the user account level. (Refer to "User information management".)

19. System ladders and user ladders

19.1 User ladder and system ladder

A ladder program has a system ladder in the system section and a user ladder in the user section. Because the manipulator may not move properly unless the system section is correctly edited, general users cannot edit the system section as well as the NX100. General users can edit only in the user ladder section. (Contact your Motoman representative when editing in the system section of the ladder program is required.)

20. Name file

20.1 What is name file?

Name file is a name information file to add a name to a relay No. or register No. used in the ladder program. (For the format of the name file, refer to "Name file format".)

20.2 Reading name file

Name file is read in at either one of the following times.

✔ When a ladder program file or CMOS file is open

✔ When a name file is read in from the menu

When a ladder program file or CMOS file is open, the name file is read in at the same time as the ladder program file or CMOS file. When a name file is read in from the menu, any existing name file can be read in whenever necessary.

The name file is saved in the same folder as the ladder program file or the CMOS file. (Even if a name file has not been prepared, the ladder program can still be edited. Refer to "Reading name file automatically".)

■ *Reading Name File Automatically (With Name File)*

When reading in a ladder program file or a CMOS file, Ladder Editor 32NX automatically reads in the name file, too. The name file automatically read in is determined by the ladder name of the ladder program used as a keyword (refer to "Ladder Name and System Register Editing".

Example:

Ladder program name : ARCWELD

Read in file name : ARCWELD.NAM

■ *Reading Name File Automatically (Without Name File)*

If the desired name file is not available when automatically reading the name file, Ladder Editor 32NX performs the operation in the following manner.

1) Selects a file suitable for the desired ladder program from the name template file prepared in default.

2) Copies the selected template file to the same directory as the ladder program file.

3) Reads in the copied template file as a name file.

In this case, Ladder Edit 32 refers to the ladder names to be read in to select the template file.

However, when the user changes the ladder name of the ladder program file, Ladder Editor 32NX may not find any file name that coincides with the ladder name template file. In such a case, the [Select name template] dialog box appears.

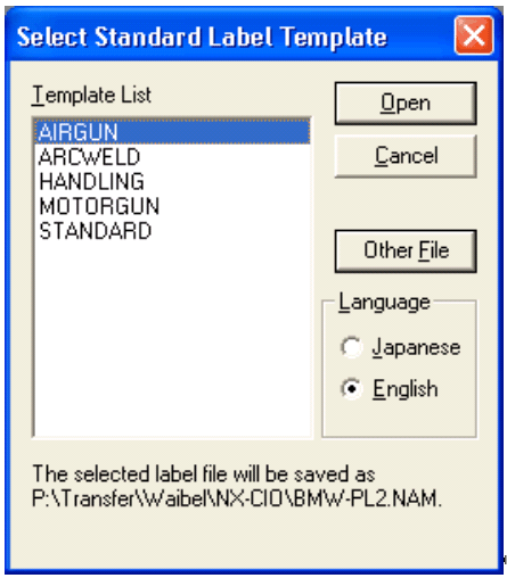
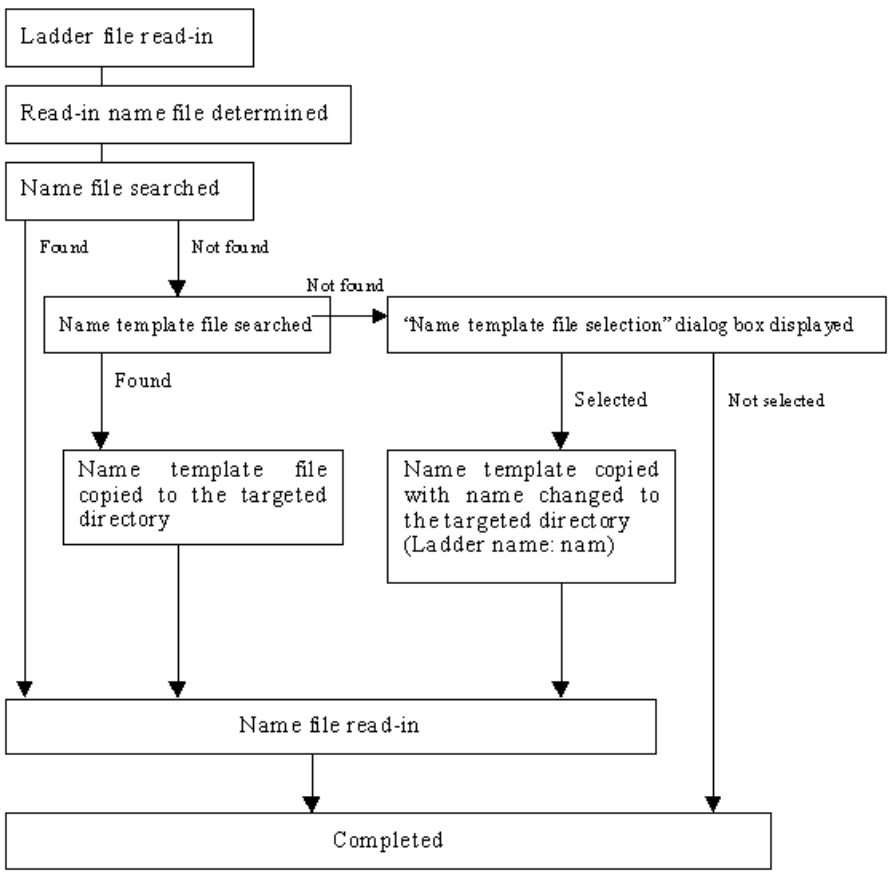


Fig.38 [Select Name Template] Dialog Box

Select the template suitable for the desired ladder program. Clicking the [Cancel] button stops the automatic reading of the name file.

The following shows the simple flowchart of the automatic reading.



20.3 Storing Name File

Store the edited name information by one of the following two methods.

- ***Stores it manually***

How to operate 1

1) Select [File] – [Save Relay Label Files]. When the [Save As] dialog box appears, input an arbitrary name for the name file to store it. Normally, the file name is stored in the following format.

Ladder name. NAM

Example: ARCWELD.NAM

2) For the ladder names, refer to "Header information".

- ***Stores it automatically***

How to operate 2

Setting the option stores the name file automatically. Refer to " Automatic storing function of name file".

20.4 Name Template File

Name template file is installed automatically when Ladder Editor 32NX is setup. The following folder is created in the folder where the Ladder Editor 32NX execution module exists, and the name template file is stored in this folder.

"Template"

21. Relay/register name list display function

The relay name list display function and register name list display function can display the name list for all relay Nos. and register Nos.. All the data of the read-in name files can be cross referenced. This "list display" dialog box has the editing function. The name information of an arbitrary relay or register No. can be edited.

■ *How to operate "Edit Relay Labels & Comments" display*

1) Select [Edit] – [Relay Labels and Rung Comments]. The [Edit Relay Labels & Comments] dialog box appears as in fig. (Some machines take time to display it.)

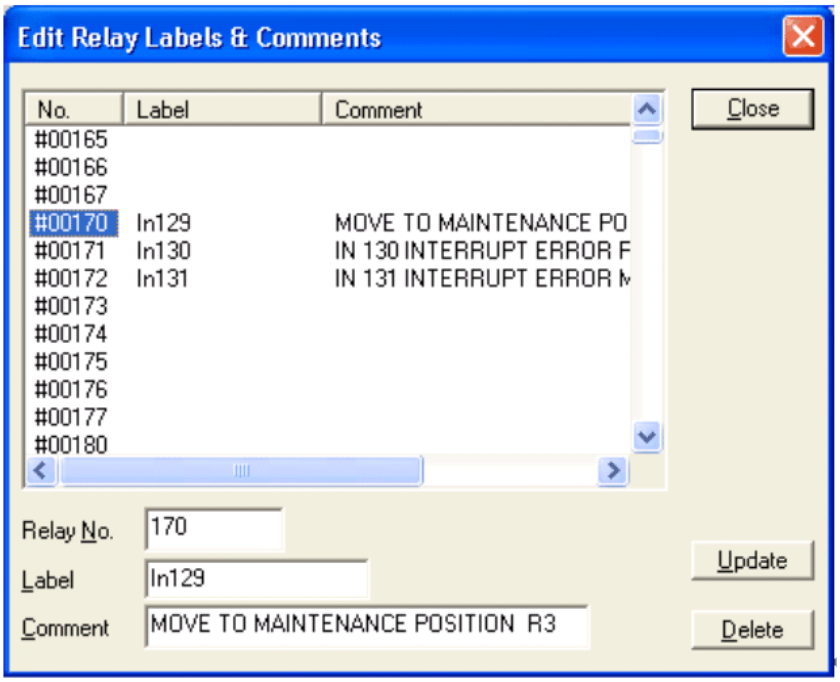


Fig.39 [Edit Relay Labels & Comments] Dialog Box

By selecting any desired relay No. from the list, the currently set data appears in the [No.], [Label] and [Comment] columns. Edit the data here. After editing, click the [Update] button to register the edited data.

If the [Label] and the [Comment] are similar for two or more relay Nos., change only the [No.], and then click the [Update] button. The name previously entered will remain. Because the names are similar, change only the characters that are different. The entire name does not have to be re-entered.

■ *How to operate "Edit Register Labels & Comments" display*

1) Select [Edit] – [Register Labels]. The [Edit Register Labels & Comments] dia-

log box appears as in fig. (Some machines take time to display it.)

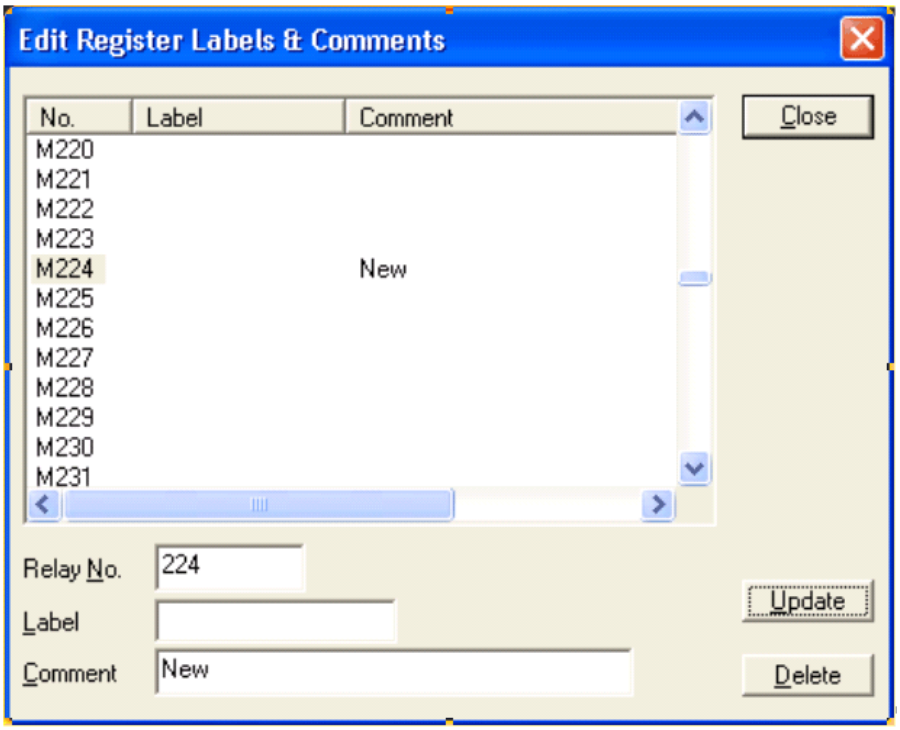


Fig.40 [Edit RegisterLabels & Comments] Dialog Box

2) Editing procedure is the same as that of "Edit Relay Labels & Comments" Display.

Normally, edit a relay or register name by opening the [Edit Relay Labels & Comments] dialog box on the ladder diagram. However, relay Nos. or register Nos. not used for ladder diagrams cannot be less of edited. These lists can be used to edit the names for all the relay or register Nos. regardless whether or not they are used on the ladder diagram.

22. Line jump function

The line jump function searches for and jumps to the line with the keyword.

22.1 Line No. Search Jump

This function jumps to the specified line No.

How to operate

1) Select [Edit] – [Go to Rung], or select (black) from the search jump tool bar (refer to "Search jump tool bar").
When the dialog box shown in fig. below appears, enter the rung No. to jump and click the [OK] button.

Fig.41 "Enter a Rung NO" Dialog Box

22.2 Parts set value search jump

This function searches for values such as relay Nos., register Nos., and constants set to the ladder parts, and then jumps to the line with the set values.

How to operate

1) Select [Edit] – [Specify Parameter], or select (brown) from the search jump tool bar (refer to "Search Jump Tool Bar").

2) When the dialog shown in fig. below appears, enter the type of the value and the set value to be searched and click the [OK] button.

Fig.42 "Relays, Register or Constants" Dialog Box

■ Previous/Next Search Jump

Previous search and next search functions can be used for searching for parts set values only.

How to operate

1) For a backward search, select [Edit] – [Find Input Relays, Registers or Constants] – [Backward].
Or select (brown) from the search jump tool bar (refer to "Search Jump Tool Bar").

2) For forward search, select [Edit] – [Find Input Relays, Registers or Constants] – [Forward].
Or select (brown) from the search jump tool bar.

Backward Search

Backward search is a function to search for the set value in front of the current line (in the direction of smaller line No.).

Forward Search

Forward search is a function to search for the set value behind the current line (in the direction of greater line No.).

Unless new set values are entered by pressing [Edit]-[Find Input Relays, Registers or Constants]-[Backward] or [Next find], the set values to be searched for do not change.

This function can be used to easily know where and how the set values are used.

22.3 OUT parts relay no. search jump

The OUT parts relay No. search jump function searches only for the relay No. set to the OUT parts of the ladder parts and jumps there. Other ladder parts can not be searched for.

How to operate

1) Select [Edit] – [Find Output Relays]. Or select from the search jump tool bar (refer to "Search Jump Tool Bar").

2) When the dialog box shown in fig. below appears, input the relay No. to be searched for and click the [OK] button.

Fig.43 "Input Value" Dialog Box

This function can be used to analyze the conditions in which the relay used in the line turns ON retroactively.

22.4 History Jump

The history jump function stores the line jump functions used in the past as the history and easily returns to the previous jump source.

This function does not exist as a menu item; Only available as a tool bar button.

How to operate

1) Select or from the search jump tool bar.
(Refer to "Search jump tool bar").

This history jump button can freely move to the line registered as jump history. Normally, this function is disabled. When jumps are performed, this function becomes enabled.

■ *Application*

An example of its most useful application is used together with "OUT parts relay No. search jump". When searching for certain relay No. ON/OFF conditions using the "OUT parts relay No. search jump", a search jump may also be performed in the further advanced lines for retroactive analyses. After completion of analysis, this history jump function can easily return to the previous line.

23. Cross reference function

23.1 Ladder Parts Set Value and reference line list display function

The ladder parts set value and reference line list display function displays on which line and for which ladder parts the specified set values are used.

How to operate

1) Select [Tools] – [Instruction Use]. The dialog box shown in fig. appears.

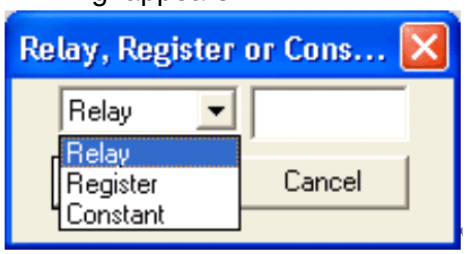


Fig.44 [Relay, Register or Constants] Dialog Box

2) After inputting the targeted set value type and the value, click the [OK] button. The [Instruction Use Table] dialog box appears.

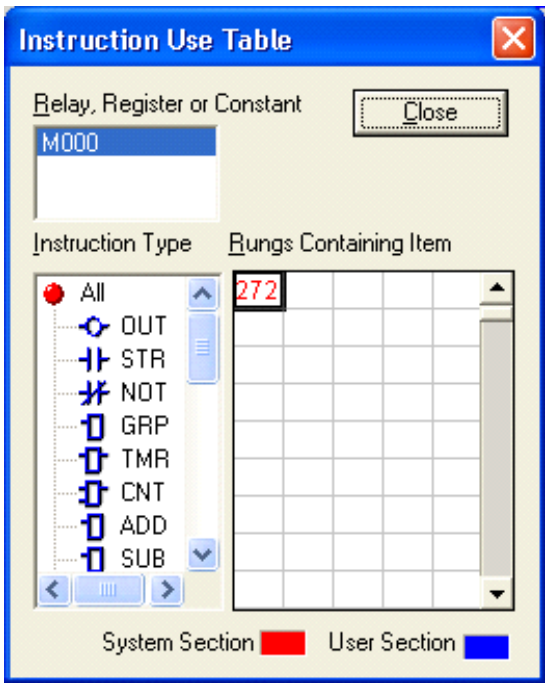


Fig.45 [Instruction Use Table] Dialog Box

■ [Relay, Register or Constants] (Reference Data) List Box

The list contains the set values to be searched for. Normally, there is only one item. However, since more than two items may appear occasionally, select one.

■ [Instruction Type] Tree

The tree consists of ladder parts. Selecting this tree item can limit the line Nos. displayed in the [Rang Containing Item] matrix.

For example, selecting "STR" item displays only the line Nos. with the set values for "STR" parts.

■ *[Rang Containing Item] Matrix*

Displays the line Nos. referring to the set values selected in the [Relay, Register or Constants] (reference data) list box. The line No. appears in red if the detected line No. is within the
system ladder area, and in blue if it is within the user ladder area.

Application

Set values in the ladder parts may be referenced by several other lines. In such cases, this function is useful to analyze where it is used or to know how it is used in other lines.

■ *Line Jump from [Reference Line List] Dialog Box*

The line jump from [Instruction Use Table] dialog box function can jump to an arbitrary line from the [Instruction Use Table] dialog box. As shown in Fig. below, double-clicking the desired line No. on the matrix moves to the targeted line.

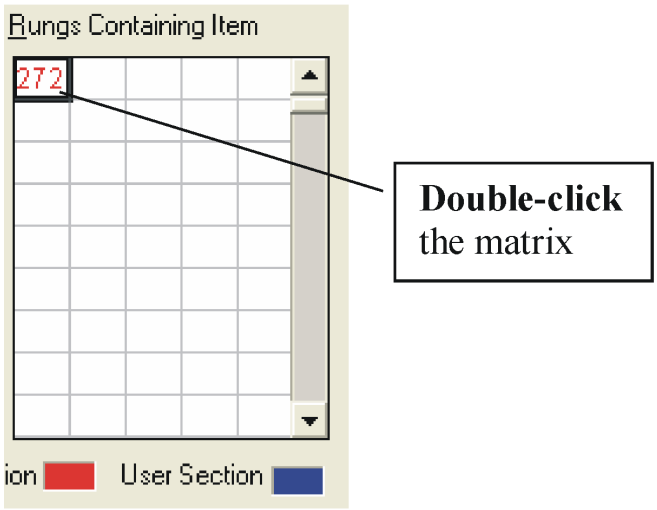


Fig.46 Double-clicking „Rang Containing Item“

Even if a line jump is performed by double-clicking, the [Instruction Use Table] dialog box does not disappear. Another jump to another line can be performed.

23.2 Function to display the relay no. use table and register no. use table

This function displays which relay Nos. or register Nos. are used or not used in the ladder program that is being edited.

How to operate

1) Select [Tools] – [Relay Use Table]. The dialog box shown in fig. appears.

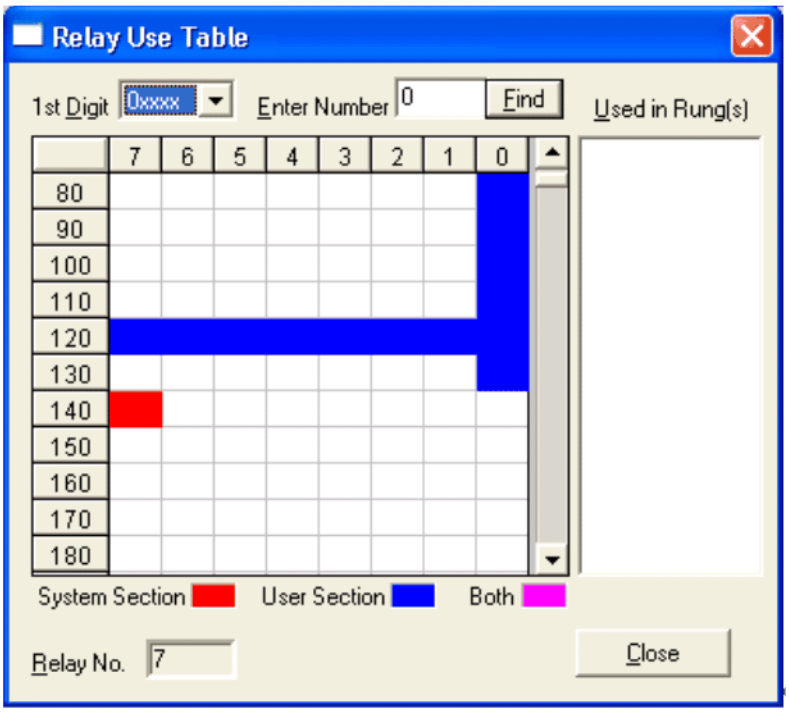


Fig.47 [Relay Use Tabe] Dialog Box

- Select [Tools] – [Relay Use Table]. The dialog box shown in fig. appears

Use State Display Matrix

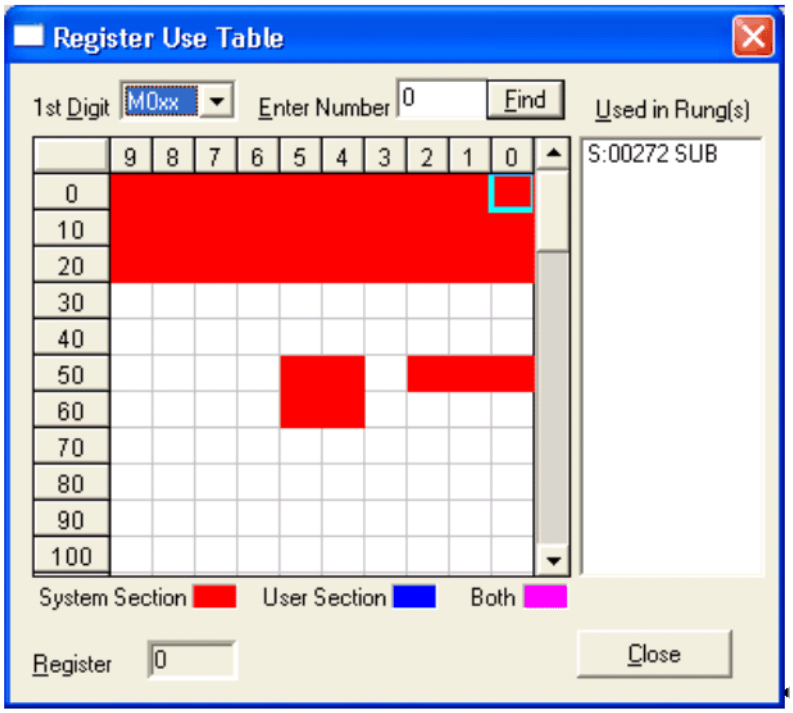


Fig.48 [Relay Use Tabe] Dialog Box

■ ***Relay Nos. (Register Nos.) used are displayed in the following colors:***

Red : Used in a system ladder.

Blue : Used in a user ladder.

Purple : Used in both system and user ladders.

In the matrix, the vertical axis displays the 10th or higher digits of the relay Nos. in units of 10, while the horizontal axis displays the 1st digit of the relay Nos.. Therefore, in the case of the use state display matrix in fig. the left top matrix is the relay No. 40007.

Clicking the colored matrix displays the list of used line Nos. in the [Use in Rang.] list box.

■ ***[1st Digit] Combo box***

The use state appears in the "use lable" in units of 10000. Select the unit in the [1st Digit] combo box.

■ ***[Enter Number] Input Box***

Inputting the relay No. (register No.) in this input box and clicking the [Find] button displays the specified relay No. in the matrix display.

■ ***[Use in Rung] List Box***

In the [Use in Rung] list box, the line information referring to the relay No. (register

No.) selected in the "use state display matrix" appears in the format shown in fig.

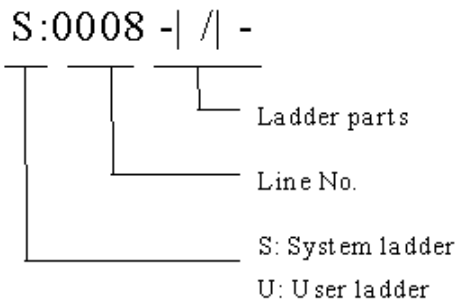


Fig.49 Format of [Use in Rung.] List Box

Application

When various relay Nos. are to be added or changed, this function is useful to use any unused relay Nos. (register Nos.)

■ *Line Jump from [Relay Use Table] Dialog Box*

The line jump from [Relay Use Table] (Register Use Table) dialog box function can jump to an arbitrary line from the [Relay Use Table] (Register Use Table) dialog box.

As shown in Fig. below, double-clicking an item in the [Use in Rung] list box moves to the targeted line.

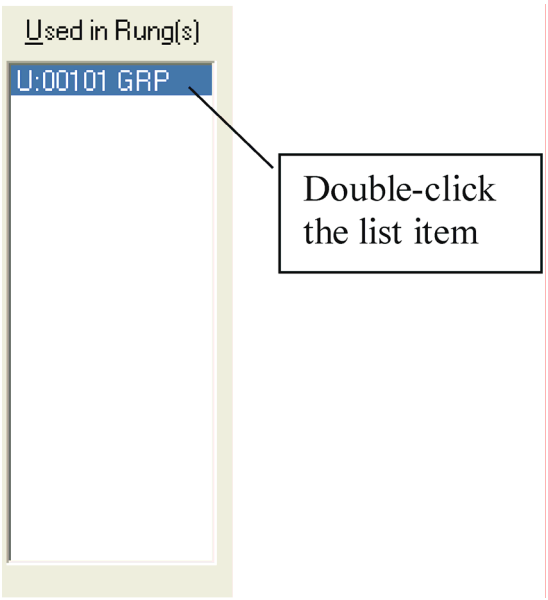


Fig.50 Double-clicking Use Line List Item

Even if a line jump is performed by double-clicking an item, the [Relay Use Table] dialog box does not disappear. Another jump to another line can be performed.

24. Mnemonic Display Function

Mnemonic display function allows displaying the ladder diagrams, which are selected in the "ladder preview" display, in mnemonic codes.

How to Operate

1. Select [Tools] – [Display Mnemonic].

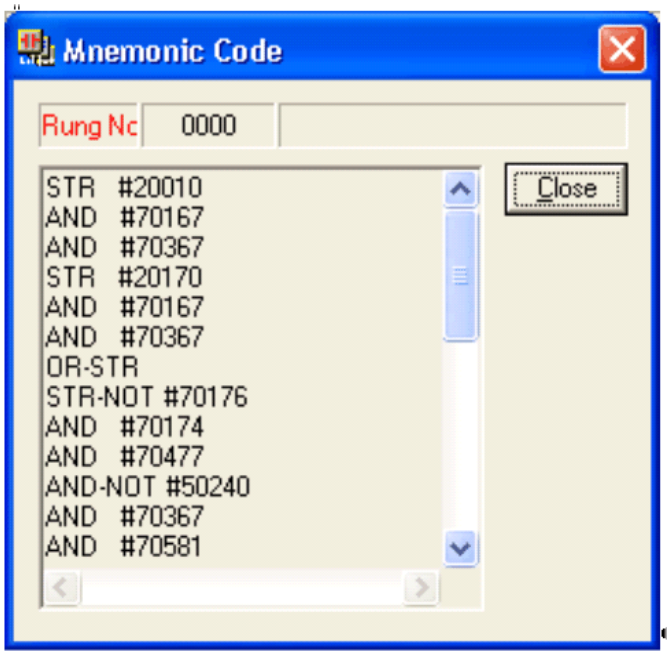


Fig.51 Mnemonic Code Display

Note: The mnemonic code display does not show mnemonic codes which are being edited in the "ladder editing" display. It only shows the mnemonic codes of ladder diagrams which went through the process of [Edit] – [Save Current Rung] – [Overwrite] or [Edit] – [Save Current Rung] – [Insert].

24.1 Mnemonic Editing Function

If the following two conditions are fulfilled, mnemonic codes can be edited directly with the mnemonic code display as shown in Fig. 22-2 appears. Condition 1) Mnemonic codes (error codes) cannot be analyzed with Ladder Editor 32NX. Condition 2) The user account level is "Operator" and above. Press [Update] when completing the editing.

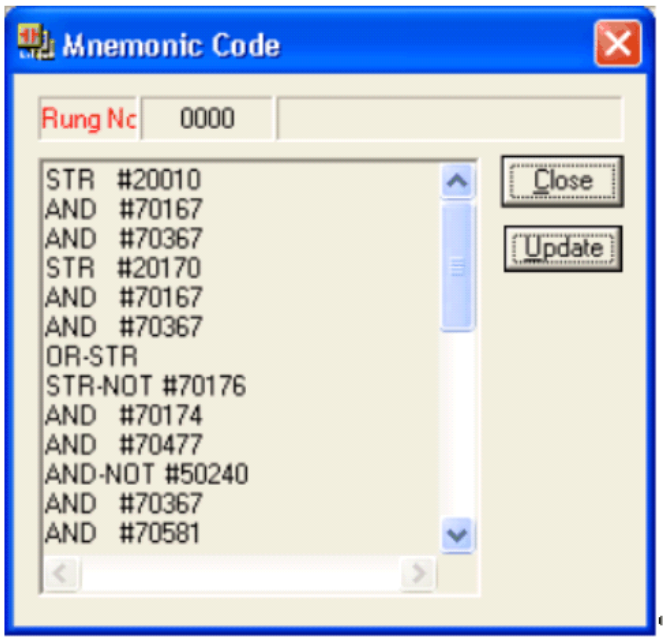


Fig.52 Mnemonic Editing Display

Note: If the edited mnemonic codes are recognized as correct codes after pressing [Update], the display screen returns to the normal mnemonic code display and the mnemonic codes become unable to be edited directly. When editing the codes again, display the mnemonic editing display on the screen.

25. Changing user account level

Change the user account level in the [Enter Password] dialog box (Fig. "[Enter Password] Dialog Box for Easy Mode" or fig. "[Enter Password] Dialog Box for Standard Mode").

How to Operate

1) Displays the [Enter Password] dialog box for logging in.
Select [Option] – [Access Control] – [Enter Password].

2) Input the password.

When a [Enter Password] dialog box appears, input the log-in name or the password, and click the [OK] button.

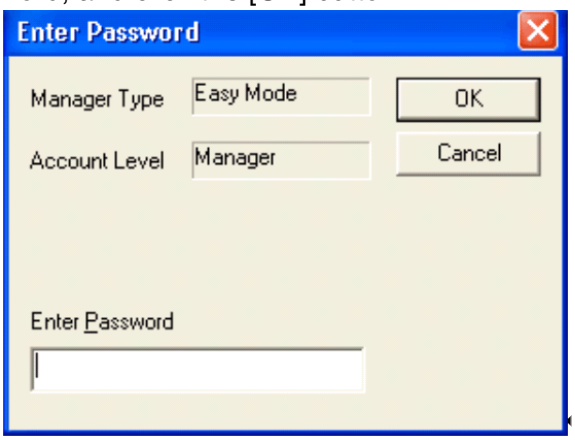


Fig.53 [Enter Password] Dialog Box for Easy Mode

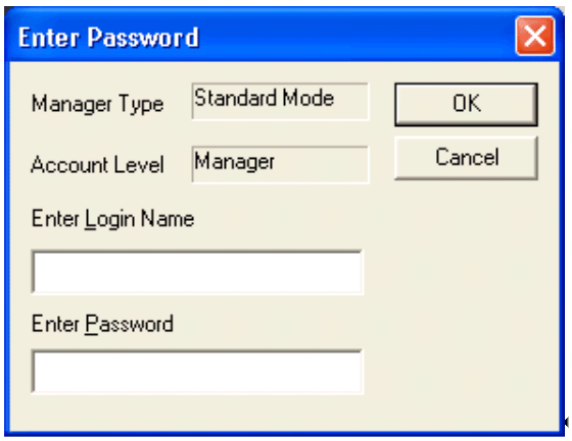


Fig.54 [Enter Password] Dialog Box for Standard Mode

26. Other settings

26.1 Setting color

Set the colors of the information displayed in the "ladder editing" display.

How to operate

1) Select [Option] – [Color Schema]. The dialog box shown in fig. below appears.

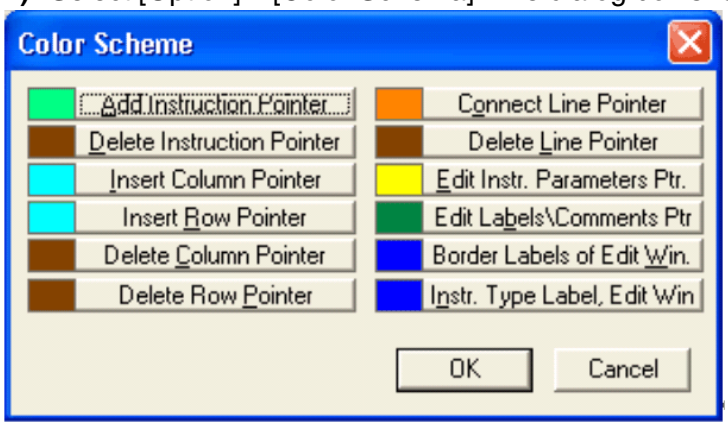


Fig.55 [Color Schema] Dialog Box

2) Select each item. The dialog box shown in Fig. below appears. Select and set any desired color.

Fig.56 [Color] Dialog Box

26.2 Setting Font

Set the character font in the "ladder editing" display. Fonts can be set individually for the editing display and the preview display.

How to operate

1) Select [Option] – [Font] – [Edit Window], or [Option] – [Font] – [Preview Window]. The dialog box shown in fig. below appears.

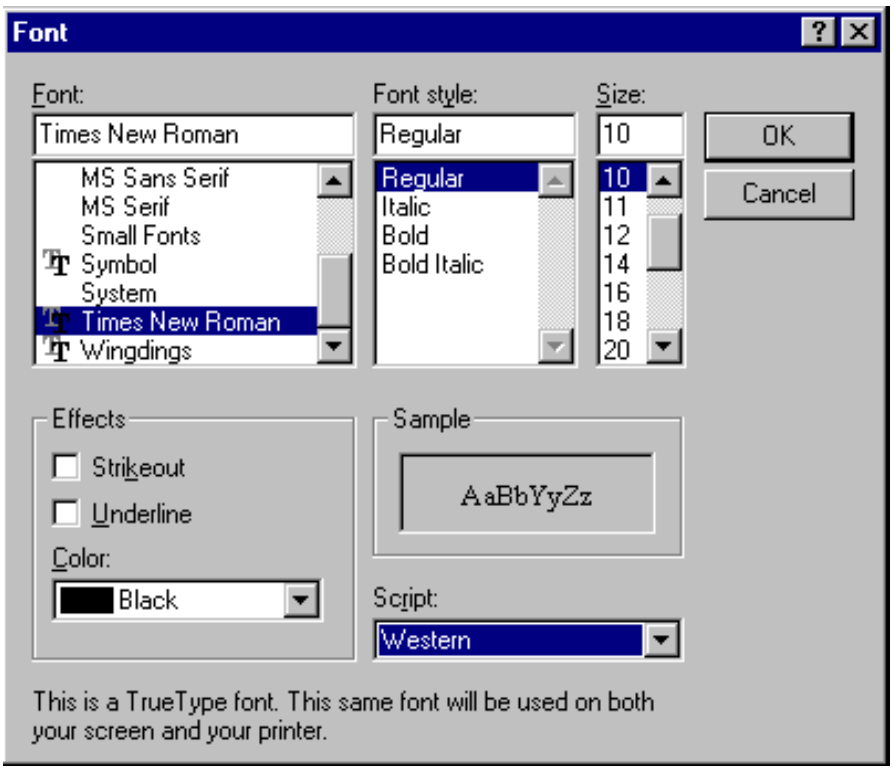


Fig.57 [Font] Dialog Box

2) Select any desired font name, the font style and size. Then click the [OK] button.

26.3 Automatic storing function of name file

Ladder Editor 32NX has a function to store the name information automatically. Validating this function updates the name files automatically when storing the ladder information.

How to operate

1) Refer to “File Settings”.

2) If a relay name or register name is changed with this function invalid, an alarm message appears when the "ladder editing" display is closed. Store the data by selecting [File] – [Save Relay Label File].

26.4 Automatic rough draft file storing function

If any interference occurs at editing and the application shuts down before storing the editing data, Ladder Editor 32NX has a function to create a rough draft file file (data file being edited) automatically.

How to operate

1) Refer to "File Settings".

2) With this function, the data in its current state is stored in a work file when a line is changed, inserted, or deleted in the "ladder editing" display. The stored file is saved with the following file name in the same folder as the ladder program file or CMOS file that is being edited.

Opened file name + ".TMP"

Note!
Even if a CMOS.HEX file is read and edited, the work file is output as a ladder file (text file).

Note!
The data that is being edited in the "ladder editing" display is not stored.

26.5 Automatic Backup Function of the Read-in File (Original File)

When storing edited data, Ladder Editor 32NX has a function to automatically back up the files before editing.

How to Operate
Refer to "File Settings".

The automatic backup function is available for the following files:

✔ Ladder files (*.LST)

✔ CMOS files (*.HEX)

✔ Name files (*.NAM)

A file name of one of these backup files has an "_" (under score) after each file extension in the same folder as the original files:

Relevant file name + extension + "_"

26.6 Rough draft file forced output function

Ladder Editor 32NX stores only the ladder programs in which compiling and grammatical checks, etc. are completed normally. However, the procedure may be interrupted temporarily during editing. To store a ladder program that cannot be compiled during editing, it can be forcely stored as a raugh draft file.

How to operate

1) Select [File] – [Save As Rough Draft].

2) When the [Save File] dialog box appears, use an arbitrary file name to store it.

Note!
Even if the reading source is a CMOS file, a work file can only output a text file as a ladder program file.

26.7 Automatic updating function

If an attempt to move to another line is made without selecting [Line Alt] or [Line Insert] when the data has been edited in the "ladder editing" display, one can select whether the [Verification] dialog box appears or the line is to be updated automatically.

For automatic updating, select either [Overwrite Current Rung] or [Insert New Rung].

How to operate

1) Displaying the [Verification] dialog box.
Select [Option] – [Auto Save Current Rung] – [Ask before Saving] to place checkmark in the box.

2) Updating automatically
Select [Option] – [Auto Save Current Rung] – [Ask Before Saving] to remove the checkmark. When the checkmark is removed, select either [Option] – [Auto Save Current Rung] – [Overwrite Current Rung] or [Option] – [Auto Save Current Rung] – [Insert New Rung] .

26.8 Switching short name display/non-display

Relay names and register names have information for short names. A short name can appear along with the relay No. or register No. corresponding to it in the "ladder editing" display.

How to operate

1) Select [View] – [Relay Labels] to place checkmark in the box.

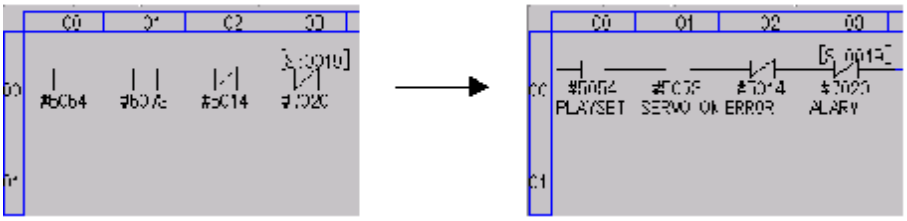


Fig.58 "Short Name" Display

26.9 File Settings

Select the Ladder Editor 32NX optional functions.

How to Operate

1) Select [Option] – [File Management], and the [File Management] dialog box appears.

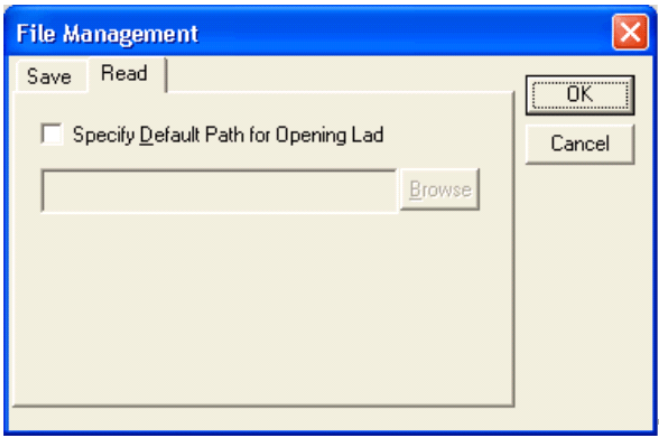


Fig.59 [File Management]

Auto save label file when save ladder file:
Automatically stores a name file at the same time as a ladder file (or CMOS.HEX).
Refer to "Automatic Storing Function of Name File".

Auto save rough draft if ladder editor unexpectedly closes:
Automatically stores the existing data as a temporary file before editing when overwriting a line or inserting a line.
Refer to "Automatic Rough Draft File Storing Function".

Automatic backup of reading file:
Creates a backup of an original file when storing a ladder file or name file.
Refer to "Automatic Backup Function of Read-in Files (Original Files)".

Specify default path for opening ladder files:
Sets the default folder of the [Open] dialog box which appeared when [File] – [Open] was selected.

27. User information management

27.1 How to manage user account

LadderEditor 32 manages the user accounts using the log-in names and the passwords to limit acces to important data. The user accounts can be managed in "Easy Mode" and "Standard Mode". The administrator of the user account levels can change the management mode. For strict user management, select "Standard Mode". The table describes the features of each management mode.

Function	Easy Mode	Standard Mode
User ID input at log-in	Not necessary. Only the password is necessary.	Necessary
Password input at application startup	Selectable	Necessary
Registration, modification and deletion of user	Not available	Available
User account level when the password input is not necessary at the startup	Backup user	Necessary

Note!
"Easy Mode" is the default management mode when Ladder Editor 32NX is initially started up, and an [Enter password] dialog box appears at the startup.

27.2 Difference depending of the account levels

The table shows the authorized functions for each account level.

Account level	1 Low ◄	2	► 3 High
Classification	Backup operator	Operator	Administrator
Meaning	Mode for backup operator	Mode for general operator	Mode for administrator who sets up Ladder Editor 32NX and is in charge of the maintenance of the system.
Authorized Functions	•Reading •Reading-in name files •Printing •Cross-referencing •Text output	•Reading •Read-in name files •Printing •Cross-referencing •Text output •Editing •Storing	•Reading •Read-in name files •Printing •Cross-referencing •Text output •Editing •Storing •Setting account management modes •Managing user information

The default users as shown in the table below have already been registered in the user accounts. Use the password assigned to each user.

Account level name	User name
Administrator	admin
Operator	user
Backup operator	backup

For each default user's password, refer to the "Default user names and password list" included with the shipment. The software administrator is responsible for storage and management of this list.

Any user other than the default users can be registered in the [User Manager] dialog box. (However, it is needed to perform the log-in for the user account at the "administrator" level.)

How to operate

1) Select [Option] – [Accsess System] – [User Manager]. The dialog box shown in fig. appears.

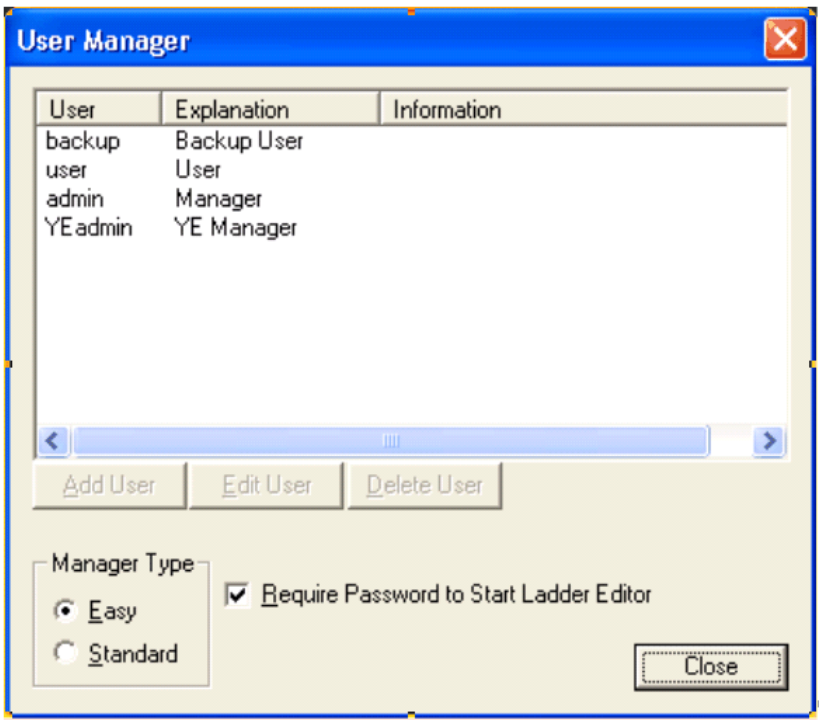


Fig.60 [User Manager] Dialog Box

[Add User] button:

Adds a new user.

Refer to "Adding / Changing the user".

[Edit User] button:

Changes the password or account level of the existing user. The default user information cannot be changed. (However, only password can be changed for the "user")

Refer to "Adding / Changing the user".

[Delete User] button:
Deletes an existing user. The default users cannot be deleted.

Manage type:
Select one of two methods to manage use accounts: "Standard Mode" and "Easy Mode"
Refer to "How to manage user accounts".

"Require password to start ladder editor" check box:
Select this checkbox and the [Enter Password] dialog box will always appear the next time Ladder Editor 32NX is started up.

27.3 Adding/Changing the User

Click the [Add User] or [Edit User] button, and the [Regist new user] dialog box (Fig. "[Regist new user] Dialog Box") or the [edit an exist user] dialog box (Fig. "[Edit an exist user] Dialog Box") appears.

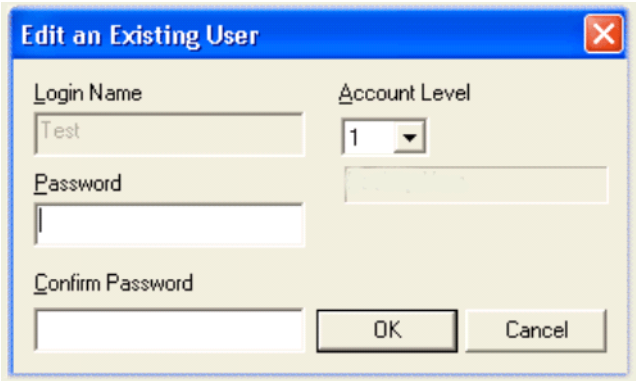


Fig.61 [Regist new user] Dialog Box

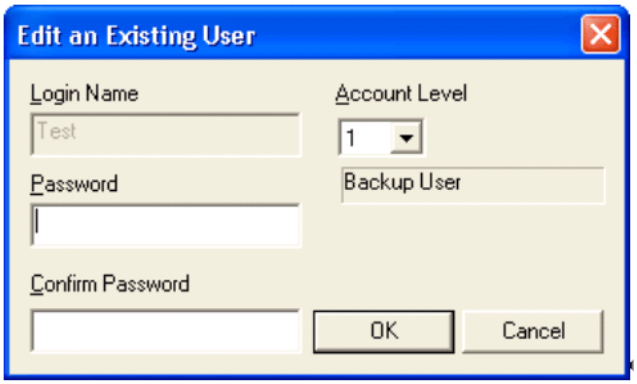


Fig.62 [Edit an exist user] Dialog Box

Input the [Login Name], [Password], [Confirm Password], and [Account Level], and then click the [OK] button. The log-in name cannot be changed in the [Edit an exist user] dialog box.

28. Appendix

28.1 Description of menu

Menu	Function	
File	—	
New	Creates a new ladder program in default.	
Open	Opens an existing ladder program.	
Close	Closes the ladder program that is being edited.	
Save	Saves an overwritten ladder program in which compiling after editing is completed successfully. To save a ladder program that is being edited and cannot be compiled, use [File] - [Save As Rough Draft].	
Save As	Select the storage file name to save the ladder program in which compiling is completed successfully.	
Save As Rough Draft	Outputs a rough draft file. Can be selected when [Overwrite] or [Insert] is selected.	
Open Relay Label File	Reads in a name file for the ladder program that is being edited.	
Save Relay Label File	Saves the relay name information. Can be selected when a relay name is edited.	
Save As Text Files	—	
Ladder Diagram	—	
User Section	Save file ladder diagram images of the user ladder.	
System Section	Save file ladder diagram images of the system ladder.	
Relay List	—	
User Section	Save file the relay No. list used in the user ladder.	
System Section	Save file the relay No. list used in the system ladder.	
Register List	—	
User Section	Save file the register No. list used in the user ladder.	
System Section	Save file the register No. list used in the system ladder.	
Relay State Table	Save file the relay No. use state matrix.	
Alarms and Messages.	Save file user alarms and user messages.	
Print	—	
Ladder Diagram	—	

Menu	Function	
User Section	Prints ladder diagram images of the user ladder.	
System Section	Prints ladder diagram images of the system ladder.	
Relay List	—	
User Section	Prints the relay No. list used in the user ladder.	
System Section	Prints the relay No. list used in the system ladder.	
Register List	—	
User Section	Prints the register No. list used in the user ladder.	
System Section	Prints the register No. list used in the system ladder.	
Relay State Table	Prints the relay No. use state matrix.	
Register State Table	Prints the register No. use state matrix.	
Alarms and Messages	Prints user alarms and user messages.	
Print Preview	—	
Ladder Diagram	—	
User Section	Previews ladder diagram images of the user ladder.	
System Section	Previews ladder diagram images of the system ladder.	
Relay List	—	
User Section	Previews the relay No. list used in the user ladder.	
System Section	Previews the relay No. list used in the system ladder.	
Register List	—	
User Section	Previews the register No. list used in the user ladder.	
System Section	Previews the register No. list used in the system ladder.	
Relay State Table	Previews the relay No. use state matrix.	
Register State Table	Previews the register No. use state matrix.	
Alarms and Messages	Prints user alarms and user messages.	
Print Setup	Displays the "printer setting" dialog box.	
Exit	Closes Ladder Editor 32NX.	
Edit	—	

Menu	Function	
Undo	Returns the edited contents to the previous state.	
Redo	Retries the operation that was returned to by [Return] operation.	
Insert New Rung	Inserts a new line after the selected line.	
Cut Rung	Deletes the ladder diagram information of the selected line.	
Copy Rung	Copies the ladder diagram information of the selected line.	
Paste Rung	Pastes the contents of [Cut Rang] or [Copy Rang] on the selected line. The ladder information that existed before pasting disappears.	
Insert Cut Copied Rung	Inserts the contents of [Cut Rang] or [Copy Rang] into the selected line. All the lines after the selected line are moved backward.	
Save Current Rung	—	
Overwrite	Overwrites and updates the ladder diagram information on the currently edited ladder diagram information for the currently displayed line.	
Insert	Inserts the currently edited ladder diagram information to the next line of the currently displayed line.	
Clear Current Rung	Clears the ladder diagram information of the currently displayed line.	
Header Information	Displays the header information of the ladder program in operation.	
Alarms and Messages	Displays the message information of the ladder program in operation.	
Relay Labels and Rung Comments	Displays the relay name list.	
Register Labels	Displays the register name list.	
Find Input Relays, Registers or Constants	—	
Specify Parameter	Searches for relay Nos., register Nos. or set constants.	
Backward	Searches for set values in the direction of the smaller line No..	
Forward	Searches for set values in the direction of the greater line Nos..	
Find Output Relays	Searches for relay Nos. used in the OUT terminal.	
Go to Rung	Searches for the specified line and jumps there.	
Go to First Rung	Moves to the first line.	
Go to Last Rung	Moves to the last line.	
View	—	
Main Toolbar	Switches between display/non-display of the tool bar.	

Menu	Function	
Navigation Toolbar	Switches between display/non-display of the search jump bar.	
Instruction Toolbar	Switches between display/non-display of the parts selection bar.	
Edit Toolbar	Switches between display/non-display of the parts control bar.	
Status Bar	Switches between display/non-display of the status bar.	
Relay Labels	Selects whether the relay short name is to be overlapped with the ladder diagram in the display.	
Output Relay User Table	Selects whether the line No. using each relay No. on the ladder diagram for the OUT terminal is to be overlapped with the parts in the display.	
Tools	—	
Check the Ladder	Compiles the currently displayed ladder program. Compiling checks for mistakes in the edited ladder program (such as overlapped relay Nos., measurement of processing time).	
Edit Instructions	—	
Delete Instruction	Changes the edit mode to the deletion mode.	
Edit Entire Row	—	
Insert Row	Changes the edit mode to the line insertion mode.	
Delete Row	Changes the edit mode to the line deletion mode.	
Edit Entire Column	—	
Insert Column	Changes the edit mode to the row insertion mode.	
Delete Column	Changes the edit mode to the row deletion mode.	
Edit Instruction Parameters	Changes the edit mode to the set value input mode.	
Edit Labels and Comments	Changes the edit mode to the name input mode.	
Quit the Editing Functions	Clears the edit mode.	
Add Instructions	—	
STR	Changes to the set mode of STR parts.	
STR-NOT	Changes to the setting mode of STR-NOT parts.	
GRP	Changes to the setting mode of GRP parts.	
TMR	Changes to the setting mode of TMR parts.	
CNT	Changes to the setting mode of CNT parts.	

Menu	Function	
OUT	Changes to the setting mode of OUT parts.	
ADD	Changes to the setting mode of ADD parts.	
SUB	Changes to the setting mode of SUB parts.	
MUL	Changes to the setting mode of MUL parts.	
DIV	Changes to the setting mode of DIV parts.	
MOD	Changing to the setting mode of MOD parts.	
BIN	Changes to the setting mode of BIN parts.	
BCD	Changes to the setting mode of BCD parts.	
MOV	Changes to the setting mode of MOV parts.	
WAND	Changes to the setting mode of WAND parts.	
WOR	Changes to the setting mode of WOR parts.	
WXOR	Changes to the setting mode of WXOR parts.	
WNOT	Changes to the setting mode of WNOT parts.	
SHL	Changes to the setting mode of SHL parts.	
SHR	Changes to the setting mode of SHR parts.	
ROL	Changes to the setting mode of ROL parts.	
ROR	Changes to the setting mode of ROR parts.	
PLS	Changes to the setting mode of PLS parts.	
PLF	Changes to the setting mode of PLF parts.	
Instruction User Table	Displays the list of lines which uses specified set values (relay Nos., register Nos., constants).	
Relay Use Table	Displays the relay No. use state matrix.	
Register Use Table	Displays the register No. use state matrix.	
Display Mnemonic	Displays the Mnemonic.	
Option	—	
Access Control	—	
Enter Password	Displays the "password input" display. Needed to edit in the system section.	
User Manager	Displays the "user manager" dialog box.	

Menu	Function	
Current Ladder Section	—	
User Section	Changes a ladder to be edited into a ladder in the user section.	
System Section	Changes a ladder to be edited into a ladder in the system section. Only users at the manager level can edit the ladders in the system section.	
Color Scheme	Sets the graphic color displayed in the "ladder editing" display.	
Font	—	
Edit Window	Sets the character font displayed in the "ladder editing" display.	
Preview Windows	Sets the character font displayed in the "ladder preview" display.	
Auto Save Current Rung	—	
Ask Before Saving	Detects modification to the ladder diagram when moving to another line during editing, and selects whether the message to verify modification is to be displayed or not.	
Overwrite Current Rung	With [Verify at Editing] above OFF, detects modification to the ladder diagram when moving to another line, and overwrites and updates the current line automatically.	
Insert New Rung	With [Verify at Editing] above OFF, detects modification to the ladder diagram when moving to another line, and inserts the current line automatically to the line to be jumped.	
File Management	Display File Management Dialog.	
Window	—	
Cascade	Overlaps windows.	
Tile	Displays windows side by side.	
Arrange Icons	Arranges icons of iconized window.	
HELP	—	
Help Topics	Displays the contents of HELP.	
Search Keyword	Displays the "keyword search" dialog box of HELP.	
Using Help	Displays how to use HELP.	
About Ladder Editor	Displays the version information.	

28.2 Description Tool Bar

■ Main Tool Bar

Button	Function	Selection
	Creates a new ladder program file in default.	[File] - [New]
	Opens an existing ladder program.	[File] - [Open]
	Overwrites and saves a ladder program in which compiling after editing is completed successfully. To save a ladder program that is being edited and cannot be compiled, select [File] - [Save As Rough Draft.].	[File] - [Save]
	Deletes the ladder diagram information of the selected line.	[Edit] - [Cut Rung]
	Copies the ladder diagram information of the selected line.	[Edit] - [Copy Rung]
	Pastes the contents of [Cut Rung] or [Copy Rung] on the selected line. The ladder information that existed before pasting disappears.	[Edit] - [Paste Rung]
	Inserts the contents of [Cut Rung] or [Copy Rung] into the selected line. All the lines after the selected line are moved backward.	[Edit] - [Insert Cut¥Copied Rung]
	Returns the edited contents to the previous state.	[Edit] - [Undo]
	Retries the operation that was returned to by [Return].	[Edit] - [Redo]
	Inserts a new line after the selected line.	[Edit] - [Insert new Rung]
	Overwrites and updates the currently edited ladder diagram information for the currently displayed line.	[Edit] - [Save Current Rung] – [Overwrite]
	Inserts the currently edited ladder diagram information to the next line of the currently displayed line.	[Edit] - [Save Current Rung] – [Insert]
	Compiles the currently displayed ladder program. Compiling checks for mistakes in the edited ladder program (such as overlapped relay Nos., measurement of processing time).	[Tool] - [Check the Ladder]
	Displays the list of lines which uses specified set values (relay Nos., register Nos., constants).	[Tool] - [Instruction Use Table]
	Displays the header information of the ladder program in operation.	[Edit] - [Header Information]
	Displays the message information of the ladder program in operation.	[Edit] - [Alarms and &Messages]
	Changes a ladder to be edited into a ladder in the system section. Only users at the manager level can edit the ladders in the system section.	[Option] - [Current Ladder Section] - [System Section]
	Changes a ladder to be edited into a ladder in the user section.	[Option] - [Current Ladder Section] - [User Section]
	Displays the contents of HELP.	[Help] - [Help Topics]

■ *Parts Tool Control Bar*

Button	Function	Selection
	Changes the edit mode to the deletion mode.	[Tools] - [Edit Instructioins] - [Delete Instructions]
	Changes the edit mode to the line insertion mode.	[Tools] - [Edit Instructioins] - [Edit Entire Row] - [Insert Row]
	Changes the edit mode to the line deletion mode.	[Tools] - [Edit Instructioins] - [Edit Entire Row] - [Delete Row]
	Changes the edit mode to the row insertion mode.	[Tools] - [Edit Instructioins] - [Edit Entire Column] - [Insert Column]
	Changes the edit mode to the row deletion mode.	[Tools] - [Edit Instructioins] - [Edit Entire Column] - [Delete Column]
	Changes the edit mode to the set value input mode.	[Tools] - [Edit Instructioins] - [Edit &Instruction Parameters]
	Changes the edit mode to the name input mode.	[Tools] - [Edit Instructioins] - [Edit Labels and Comments]
	Clears the "ladder diagram information" display of the currently displayed line.	[Edit] - [Clear Current Rung]
	Clears the edit mode.	[Tools] - [Edit Instructioins] - [Quit the Editing Functions]

■ *Search Jump Tool Bar*

Button	Function	Selection
	Searches for relay Nos. used in the OUT terminal.	[Edit] - [Find &Output Relays]
	Searches for relay Nos., register Nos., or set constants.	[Edit] - [Find Input Relays, Registers or Constants] – [Specify Parameter]
	Searches for set values in the direction of the smaller line Nos..	[Edit] - [Find Input Relays, Registers or Constants] – [Backward]
	Searches for set values in the direction of the greater line Nos..	[Edit] - [Find Input Relays, Registers or Constants] – [Forward]
	Searches for the specified line and jumps there.	[Edit] - [Go to Rung]
	Moves to the first line.	[Edit] - [Go to First Rung]
	Moves to the last line.	[Edit] - [Go to Next Rung]
	Jumps backward in the jump history.	
	Jumps forward in the jump history.	

■ *Ladder Parts Tool Bar*

Button	Function	Selection
	Changes to the setting mode of STR parts.	[Tools] - [Add Instructions] - [STR]
	Changes to the setting mode of STR-NOT parts.	[Tools] - [Add Instructions] - [STR-NOT]
	Changes to the setting mode of GRP parts.	[Tools] - [Add Instructions] - [GRP]
	Changes to the setting mode of TMR parts.	[Tools] - [Add Instructions] - [TMR]
	Changes to the setting mode of CNT parts.	[Tools] - [Add Instructions] - [CNT]
	Changes to the setting mode of OUT parts.	[Tools] - [Add Instructions] - [OUT]
	Changes to the setting mode of ADD parts.	[Tools] - [Add Instructions] - [ADD]
	Changes to the setting mode of SUB parts.	[Tools] - [Add Instructions] - [SUB]
	Changes to the setting mode of MUL parts.	[Tools] - [Add Instructions] - [MUL]
	Changes to the setting mode of DIV parts.	[Tools] - [Add Instructions] - [DIV]
	Changing to the setting mode of MOD parts.	[Tools] - [Add Instructions] - [MOD]
	Changes to the setting mode of BIN parts.	[Tools] - [Add Instructions] - [BIN]
	Changes to the setting mode of BCD parts.	[Tools] - [Add Instructions] - [BCD]
	Changes to the setting mode of MOV parts.	[Tools] - [Add Instructions] - [MOV]
	Changes to the setting mode of WAND parts.	[Tools] - [Add Instructions] - [WAND]
	Changes to the setting mode of WOR parts.	[Tools] - [Add Instructions] - [WOR]
	Changes to the setting mode of WXOR parts.	[Tools] - [Add Instructions] - [WXOR]
	Changes to the setting mode of WNOT parts.	[Tools] - [Add Instructions] - [WNOT]
	Changes to the setting mode of SHL parts.	[Tools] - [Add Instructions] - [SHL]
	Changes to the setting mode of SHR parts.	[Tools] - [Add Instructions] - [SHR]
	Changes to the setting mode of ROL parts.	[Tools] - [Add Instructions] - [ROL]
	Changes to the setting mode of ROR parts.	[Tools] - [Add Instructions] - [ROR]
	Changes to the setting mode of PLS parts.	[Tools] - [Add Instructions] - [PLS]
	Changes to the setting mode of PLF parts.	[Tools] - [Add Instructions] - [PLF]

■ *Name file format*

The following shows the format of a name file.

```
//TYPE:ARCWELD :                          Ladder name
///11280 :                                Relay block No.
ssssssss,LLLLLLLL :                       Name of 11280
aaaaaaaa,BBBBBBBB :                       Name of 11281

For eight items

Arestart, arc off restart processing memory reset
Restart, restart processing reset
Inching, inching
Retract, retract :                        Name of 11287
///20010 :                               Next relay block No.
,External start
,
,Call master job
,Alarm/error reset
,
//REGISTER :                              Specify register name
                                          section
M209=ssssssss,LLLLLLLLLL :                Register name
M210=Aconfirm relay sticking,
arc confirm relay sticking
M211=Arc shortageR,
arc shortage (robot side)
M212=Power failure, welder malfunction
M213=Retract request, wire retract request
:
```

[Relay Name:]
Short name : Within 8 characters
Long name : Within 60 characters
[Register Name:]
M000 = Short name, long name
Short name : Within 8 characters
Long name : Within 60 characters
"M" must be added to the first character in the name.

28.3 Frequently-asked questions

When the driver has been installed with USB type key connected to personal computer

1.Under the state that the USB type key is attached to personal computer, delete the item registered as "USB Token" in Device Manager.
2. Uninstalled the driver (Sentinel System Driver 5.41.1(32-bit)) with [Add/Remove Programs].
3. Install the driver with key detached from personal computer.

With the procedure above, the driver can be performed normally.
When the previous version driver (Ver.PD-5.39.2) has been installed after installing the driver Ver.PD-5.41.1

In this case, a problem may arise rarely. Therefore, uninstall the driver Ver.PD-5.39.2(Sentinel System Driver)by [Add / Remove Programs].

When the software program doesn't start properly with D-SUB type.

There is a possibility that the driver of the hardware lock key is old type or doesn't exist.
The drive-setup-file can be found in the application directory (Sentinel Installer.exe).
Note: Be sure to install the driver under WindowsXP/2000 environment.

Note: When installing the driver under WindowsXP/2000 environment, be sure to login on administrator mode in order to add files to system folder and